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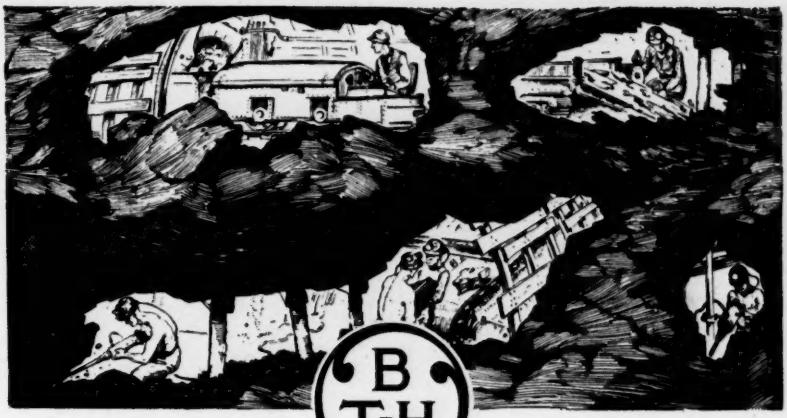

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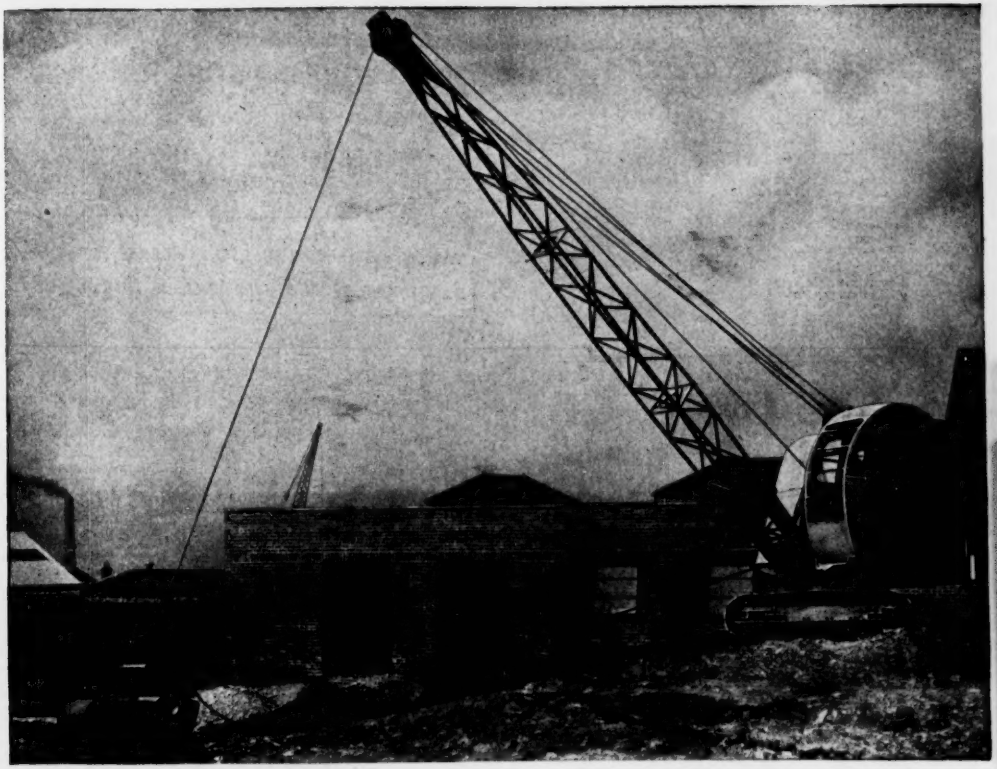

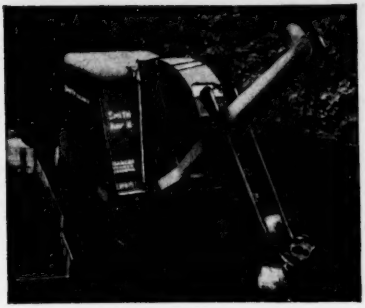

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NOTES AND COMMENTS

The Vermiculite Industry

A mineral which has attained considerable importance in the last few years is vermiculite, which is a product of biotite-phlogopite mica with the alkalis removed and water added—whether hydrothermal or percolating ground water. The development of the industry has been principally in the United States, which is by far the largest producer, and where the mineral and its uses have been mainly investigated. The Mineral Resources Division of the Colonial Geological Survey has just published a valuable survey of known world occurrences (with particular reference to British Commonwealth countries), methods of processing and industrial uses, prepared by Mr. E. R. Varley.

Though vermiculite was first described in the United States as far back as 1824, its peculiar properties were not appreciated till about 1921 when small scale production started. Ninety per cent of the output to-day is from the State of Montana where the Zonalite Company operating mines near Libby is by far the most important producer. The total output of the United States in 1950 has been reported as 208,096 s.tons valued at $2,122,427, an average of $10.20 per s.ton. Production has gone up steadily from 2 tons in 1924 to the figure just quoted for 1950. In all, the United States has produced 1,107,926 s.tons.

The Transvaal is the only other important vermiculite field apart from the U.S.S.R. of which little is currently known, though the output is believed to be considerable. So far only the deposits at Loolekop in the Palabora area of the Low Veldt near the confluence of the Oliphants and Selati Rivers have been worked. This is the largest deposit known in the Commonwealth and from it exports have been made, not only to Great Britain but to the United States. The output in 1950 has been reported as 41,753 tons with an average f.o.r. value of 110s. per ton. Price landed in the U.K. is much higher and is given as £12 per ton for crude and £26 for the finer grades up to +£30 per ton for the coarsest grade of exfoliated vermiculite, ex-works. In the United States the average price last year for screened and cleaned vermiculite is given as $12-$14 per ton f.o.b. In the Palabora area many millions of tons of workable and marketable mineral are judged to be available. So far opencast quarrying methods are employed after an overburden of some 3-5 ft. has been removed. In this connection it is perhaps interesting to note that the Libby deposits in Montana have been proved to a depth of 800 ft. by boreholes representing reserves of between 25,000,000 and 100,000,000 s.tons of pure vermiculite, though so far opencast working with mechanical shovels is the general practice.

Southern Rhodesia has come into the picture more recently, the output in 1950 being estimated at about 700 s.tons. Some of the samples sent to England were exceptionally clean and very high grade vermiculite, but the extent of the reserves does not appear to have been closely estimated.

Late in 1950 vermiculite was discovered over a large area at Pike Lake, in Ontario, where a preliminary estimate put the quantity available at about 300,000 s.tons. Production was expected to start last year, by a company formerly purchasing South African material.

There is a small production in Western Australia which amounted to 363 tons in 1943, falling to 120 tons in 1950, principally from the Young River near Ravensthorpe. Production is said to be sufficient for Australia's needs. No exports appear to have been made so far.

There are large deposits of vermiculite in the State of Minas Geraes in Brazil, as well as other occurrences in Goiaz, and in the north-east of the Republic, and one Rio de Janeiro firm is stated to have been exporting to the United States at the rate of 900 tons a month in 1948.

The above appear to have been the only sources of commercial production up to a recent date but occurrences of vermiculite are known in many countries, though not necessarily of any economic importance, under current price and transport conditions. The list includes France, Italy; Queensland, South Australia, Tasmania and the Northern Territory, within the Australian Commonwealth; India, Burma, Japan, Madagascar, Portuguese East Africa, Tanganyika, Kenya, Uganda, Nyasaland, Bechuanaland, Swaziland, and Sierra Leone.

While there are few uses for vermiculite in the raw state, the exfoliated material is employed in a wide variety of industries principally for thermal, accoustic, and refractory insulating uses and in light-weight concrete. A spray-gun has recently been developed in the United King-

dom which facilitates the use of vermiculite plaster. Many furnaces of all types now employ vermiculite compositions for insulation and in the manufacture of light-weight refractory insulating bricks. Other uses are for lubricants and as a substitute for graphite in lubricating compounds, as a sealing compound for oil-well drilling and as an inside lining in oil-cracking units, as well as in foundry casting practice. It forms an excellent electrical insulator and has been used to protect buildings and ships against incendiary bombs. In fact the list of current applications is very wide and will doubtless expand.

Lack of Geologists Limits Geological Survey Programme in Ontario

The Ontario Department of Mines will spend some $24,000 in the current fiscal year on airborne magnetometer surveys which will, in part, compensate for the decline in the estimates for the geological surveys normally carried out.

The Hon. W. S. Gemmel, Minister of Mines, in making this announcement to the Ontario Legislature, said that at present it was almost impossible to obtain geologists for the geological branch of the Department. It was thought, Mr. Gemmel said, that the Department would be able to put fifteen parties in the field during the current year, but owing to the shortage of trained geologists the Department would consider itself fortunate if it was able to put as many as eleven parties in the field. In 1951, fourteen geological survey parties were out on field work.

Giving some figures concerning the cost of operating mine rescue stations he said that it was at present estimated that the total cost of operating the five stations in Ontario would amount to $70,000, of which all but $1,000 was recoverable from the Workman's Compensation Board. The mines themselves maintain over 100 active teams for emergency, each team comprising five men.

Mr. Gemmel was optimistic about Ontario's future mineral development and stated that the estimated aggregate value of the province's mineral production during 1952 would be approximately $437,000,000 which compares with the value of the mineral production in 1951 of $365,000,000. However, he expressed disappointment at the fact that Canadian capital was not participating in this development, most of the money coming from the U.S.A.

Mechanization of Indian Coal Industry

The Government of India has recently accepted the recommendations regarding the mechanization, on a planned basis, of the country's coal mines contained in the report published in the autumn of last year by the Working Party for the Coal Industry. As a result, the Indian Coal Board is to undertake an investigation in order to ascertain the extent to which mechanization can be introduced in existing mines. Moreover, when permission is given for the opening up of new coal mines, a condition will be imposed that all new developments should be planned and executed as far as practicable with the maximum use of cutting and conveying machines.

Other Government decisions on this report are the continuation of the existing coal control measures; legislation by the Central Government, for the conservation of metallurgical coal, and the recent establishment of the Coal Board, which will shortly set up an informal technical committee to examine working conditions of collieries producing metallurgical coal prior to the introduction of measures for their conservation.

The principles regarding zonal production and distribution of coal contained in the Working Party's report have also been accepted by the authorities.

Portugal

(From Our Own Correspondent)

Oporto, May 6

The easing off in demand for all minerals is becoming increasingly pronounced in the last month. Certain countries are displaying an entire lack of interest, while others are only interested at lower prices. It is worth noting that in the first quarter of the year the United States took more wolfram concentrates than Great Britain, and the export figures in March were less than in February. Exports of cupreous pyrites were also down in March at 19,078 tonnes, as compared with 27,092 tonnes in February.

The countries to which wolfram concentrates were exported in January, February and March of this year, together with the cumulative totals for 1951, are shown in the following table:

Wolfram Concentrates Exported Country	*January* (1952) (*tonnes*)	*Feb.-March* (1952) (*tonnes*)	*Jan.-Dec.* (1951) (*tonnes*)
U.K.	135	165	2,288
U.S.A.	50	267	1,697
Germany	25	78	76
Sweden	Nil	Nil	74
France	35	142	60
Belgium	Nil	Nil	12
Italy	Nil	Nil	11
Others	Nil	5	5

In the following table, figures are given for other Portuguese minerals exported in January, February and March of this year, together with the cumulative totals for 1951.

Materials Exported	*January* (1952) (*tonnes*)	*Feb.-March* (1952) (*tonnes*)	*Jan.-Dec.* (1951) (*tonnes*)
Tin Concentrates	89	148	1,025
White Arsenic	50.8	234.2	807
Cupreous Pyrites	25,887	46,170	570,939
Manganese Oxide	600	887	10,536
Iron Ore (estimated)	—	—	10,000

Montana

(From a Correspondent)

Butte, April 15

Mr. E. S. McGlone, vice-president in charge of the Anaconda Copper Mining Company's western section, stated recently that estimates of ore available for the Great Butte project have been increased. In one area several million tons have been added to the estimate and future exploration may result in the original figure of 150,000,000 s.tons being increased by nearly 100,000,000 more. The Kelly mine, one of the greater Butte project propositions, is turning out ore at the rate of 2,000 s.tons a day which should be increased to 5,000 s.tons currently and to 9,000 s.tons within a year. The capacity of the Anaconda concentrator is to be increased to over 32,000 s.tons of ore daily. In the next five years zinc production should be more than doubled.

The Coronado Copper and Zinc Co. of Los Angeles has acquired the Blue Bird group of properties in the south-west portion of Butte. The Company is controlled by Harvey Mudd and associates, who also operate the Cyprus Mines Corporation, the largest producers of copper and iron pyrites in Cyprus.

The U.S. Geological Survey has released a preliminary report on nine uranium deposits in the Clancey district about 10 miles south of Helena. The Colmont Uranium Mines Company was incorporated in Montana on April 5 The Defence Minerals Procurement Agency has approved a loan of $1,750,000 to the American Chrome Company to resuscitate the Mouat Mine, Stillwater County, Montana.

South Africa

(From Our Own Correspondent)

Johannesburg, May 4

The present constitutional crisis in the Union is having its effect on the gold share market. Since the beginning of the crisis gold share prices have slumped by approximately 12½ per cent and fears are being expressed that it may react adversely on the future supply of capital from both internal and external sources for the further development of new mining enterprises. Consequently, the investigation of new undertakings, regardless of their potentialities, is being held up.

THE MAJOR PROBLEM: SHORTAGE OF POWER

This climate of uncertainty must be taken into account when considering the major problem now facing the gold mining industry and other productive activities, namely, the shortage of power. This is steadily becoming more and more acute and with winter approaching additional power cuts are having to be made in an effort to shift the maximum load to off-peak hours. As a result the mines are finding it increasingly difficult to maintain milling capacity, since during the peak period only essential activities such as pumping can be kept at full strength. Several chairmen of gold mining companies have, in their recent annual statements, laid great stress on these difficulties and have intimated that if the present shortage continues gold production may be affected in the near future. Witwatersrand Nigel provides a good example of the way in which the present power shortage is affecting production. This mine has just brought into operation its Poortje reduction plant and although it has a capacity of 10,000 tons a month, it is doubtful if more than 6,000 tons can be utilized.

The power shortage is being aggravated by the requirements of the uranium producers and the auxiliary plants in connection with this activity, which will come into operation in the near future. Some measure of relief will be given by the two new power stations which are in course of erection, one near Klerksdorp and the other near Vereeniging with capacities of 400,000 and 300,000 kW. respectively. But these are not enough. Work has, therefore, begun on a further power station at Witbank, which will have a capacity of 180,000 kW. When planned originally, the total capacity of these plants was smaller, but it has been stepped up to its present capacity to meet the needs of the uranium industry. In order to finance this scheme the chairman, general manager and other high officials of E.S.C.O.M. have left for the United States to discuss with the Export-Import Bank, South Africa's application for a loan of $20,000,000. The outcome of these negotiations are awaited with particular interest in the Union as it may provide an indication as to how the recent political events in South Africa have been received in America.

GOOD O.F.S. BOREHOLE VALUES

Looking on the brighter side of the picture there have been some very encouraging results from the Orange Free State. At President Brand a value of more than 3,250 in.-dwt. was obtained at a relatively shallow depth in a borehole put down to obtain information to assist in the underground lay-out. This was followed by the announcement from President Steyn of an average value of 966 in.-dwt., the highest yet recorded, in its No. 2 shaft. Apart from enhancing the future prospects of these two properties the good values recorded add weight to the theory that a wide zone of enrichment runs in a south-easterly direction through the particularly rich boreholes of Free State Geduld and Western Holdings, where it divides into two shoots, one passing down through President Brand and the other going diagonally across President Steyn through its No. 2 shaft area.

Last month Welkom entered the profit earning stage and it has now announced that the existing plant which was taken over from Springs, is to be extended by the addition of another unit having a capacity of 25,000 tons a month, bringing the total milling capacity to approximately 100,000 tons per month. Consequently, underground development work has been accelerated to provide the additional ore reserves required.

An interesting development at both Western Holdings and Free State Geduld, and one which may be extended to other properties, is that in the initial stages large footages will be developed off-reef as the main haulages are likely to be in the footwall. The experience obtained from developing mines in the O.F.S. is that less water is encountered in the footwall than in the hanging wall and it is expected that a more rapid rate of development will be possible. It is essential that a connection between the two shafts on both properties be completed as soon as possible to enable stoping operations to begin. At Western Holdings, however, development ore is available which will allow the reduction plant to be run in and metallurgical tests to be carried out early in the second half of this year.

Good progress has also been maintained at Virginia and the reduction plant should be completed within a very short time. Thus, underground work is being speeded up at the expense of some of the major construction work, but this will be resumed shortly before the mine is ready to begin milling operations.

GOLD AS A BY-PRODUCT OF A BY-PRODUCT

On the uranium front the main development is the extension of the original agreement which involved extraction of the metal from current residues to include the treatment of slimes from the slimes dams, which has necessitated larger plants being installed than was originally envisaged.

The new revised price formula for uranium production on a cost plus basis provides for a higher price than that agreed upon in 1950 and the companies thus expect to earn higher profits than originally anticipated. The loan funds obtained for the erection of these plants will be repaid solely from the sales of uranium, thereby relieving the mines of the capital risks entailed in the erection of the plants. The companies are also entitled, for purposes of tax, to start redemption of the capital expended on the uranium plant during the year in which this expenditure took place and will not have to wait until earnings from uranium production are received.

At Western Reefs and Daggafontein the near future will see gold being obtained as a by-product of a by-product of gold mining. Both these properties produce a pyritic flotation concentrate to be used in the manufacture of sulphuric acid needed for uranium production. The residue of this process contains gold and the construction of the necessary plants, at a cost of about £50,000 each, has been undertaken to recover the gold.

An interesting item of news is that drilling on the farm Boschkoppie in the Rustenburg district has proved the existence of the Merensky reef, which is the platinum-bearing horizon at present being exploited by the Rustenburg and Union Platinum Mines. Encouraging values have been found and underground exploratory work is in progress. A 45 per cent interest is held in this venture by Transvaal Consolidated Lands and Exploration.

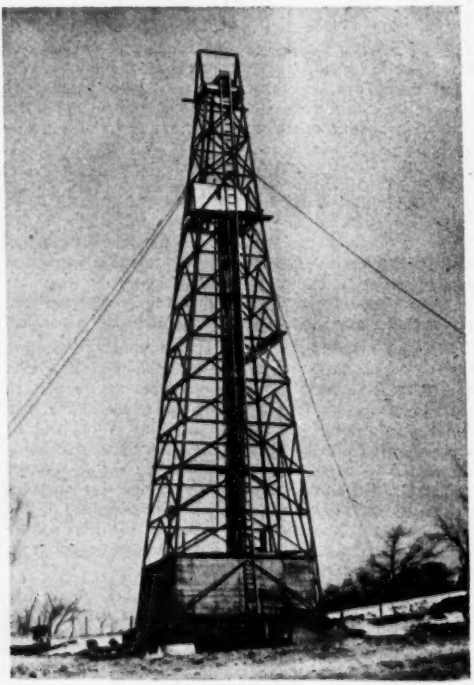
Diamond Drilling Symposium in Johannesburg

By A SPECIAL CORRESPONDENT

The following is the first part of a comprehensive report on the three day symposium which opened in Johannesburg on Monday, April 21, under the auspices of the Chemical, Metallurgical and Mining Society of South Africa. More than 100 members attended, amongst them over thirty from various countries of the world. The papers presented offered a wide cross section of current diamond drilling technique.

Under the auspices of the Chemical, Metallurgical and Mining Society of South Africa a three day symposium with additional field trips to important South African mining properties was opened on Monday, April 21st, at Kelvin House. More than 150 members attended amongst them over 30 from other African territories, Australia, Belgium, Great Britain, U.S.A., etc. The meeting and the field trips were well prepared by Dr. R. S. Young, Director of the Diamond Research Laboratory. The latter was founded some years ago by the Chairman of the Anglo-American Corporation, Sir Ernest Oppenheimer.

Sir Ernest Oppenheimer in his speech to members of the symposium pointed out that there was no truth in the statement that the Diamond Corporation retains sacks of



(Courtesy of The E. J. Longyear Co.)

Derrick for Deep Hole Rig in America

diamonds. There was only the justified diamond stockpile of the American Government. Further, there was no restriction on output and never had been. There was, however, an allocation for gem diamonds, but with regard to industrials each mine was free to produce as much as it could.

First hand information on the occurrence, mining and recovery of diamonds was presented by Mr. A. Royden Harrison, who after giving a brief history of the important diamond discoveries, said that according to *Jewelers' Circular Keystone*, world production in 1951 was 15,261,000 ct. of which 14,961,000 ct. or 98 per cent, were found in Africa. The borderline between gem and industrial diamond output varies but last year's (1951) production of industrial diamonds was 12,000,000 ct. or 79 per cent of the production figure. The distinction between alluvial findings and those of pipes, where the diamond is found in the Blueground or Kimberlite, is that the pipes produce larger quantities. Yet pipes are rarely discovered, and if lying under deep overburden, may never be discovered.

The author then described the mining methods applied, and in contrast described the present day workings of the old Indian Panna Mine, an account which was most probably based on a recent personal visit. This mine lies under 70 ft. of overburden. After removal of overburden a spiral gangway had been cut into the walls, up which the Indians brought the rock in baskets. The working was in primitive tunnels with the conglomerates crushed by hammer and sorted by hand.

Whole families are working, with children from six years of age and older being called upon to work half a day in the open and half a day in the tunnels. The yield is 10 ct. per 100 loads (1 load = 0.8 ton). Stones of good quality are recovered; for instance, 52 perfect octahedra (up to 25 ct. each) of 325 ct. were assembled.

The Premier Mine near Pretoria is the largest and most modern diamond mine. It is expected to bring the production up to 1,000,000 ct. per year, of which 80 per cent are industrials. The Premier is a pipe mine with an elliptical funnel, and before the closing down in 1932 the working was opencast and a depth of 610 ft. was reached. The mine was re-opened in 1950, and now the working is underground, with 12,800 tons of rock material brought up and treated on surface daily. New plants include a large heavy-media plant, working at a specific gravity of 2.90, and vibrating grease tables. The ferro-silicon used in the heavy media plant is recovered by washing the concentrates and subsequently by the use of magnets. For the recovery of small diamonds electrostatic separation is applied. Improvements recently introduced in this mine, which later was visited by members of the symposium, resulted in a 57 per cent reduction in native labour and an 11 per cent reduction in white labour.

Kimberley is surrounded by pipe mines which have produced a total of 350,000,000 ct. A number are again producing. Improvements in recovery techniques are also contemplated there, as for example the well known Pulsator plant with its side shaking grease tables which will in future be eliminated by a heavy media plant and vibrating grease tables in addition to electrostatic separation.

THE BIGGEST PRODUCER

The Belgian Congo is at present the biggest producer with a yearly output of about 10,000,000 ct. The first mines were in the Kasai River area, where diamonds are found in gravel. The yearly production is 600,000 ct. from which 50 per cent are gemstones. The main production centre is, however, the Bushimae area practically in the centre of the

Congo where diamonds are found in gravels, but Kimberlite rocks have also been discovered. From these stones 98 per cent are industrials. Large hydro-electric plants are under construction.

The Angola findings are quite extended and occur in three types: valley, hillside and on terraces. There is an abundance of water and overburden is removed by water, with a stretch of 30 miles exploited at one time. The average size is 5.36 stones per ct. and the yield 0.71 ct. per cu.m. With the exception of a few white supervisors and trainers all the heavy machines are operated by natives, with excellent results.

In Tanganyika the diamonds occur in gravels on a bed rock of granite, but the real diamond contents have not yet been established. A heavy media plant and rotary jigs have recently been installed. The yield is said to be 20 ct. per 100 loads. Sierra Leone yield is 66 per cent stones of gemstone quality of an average size of 3 to 5 per ct. The yield is 2 to 2.5 ct. per cu. yd. The stones found in the Gold Coast are very small, 20 to 22 per ct., with a yield of 2.3 to 3 ct. per cu. m. All foremen and supervisors are natives.

ALLUVIAL AND MARINE FINDINGS

The findings in French West Africa are all alluvial. The alluvial findings in South Africa extend in a wide zone from the Premier Mine to the mouth of the Orange River. The record years for alluvial findings were the late 1920's, when production reached 100,000 ct. a year.

Marine findings are concentrated along 200 miles of coastline north and south of the Orange River mouth. Typical of these findings is the Klenzee mine which produces 98 per cent of gemstones. The overburden is 25 ft. to 70 ft. high and 6,000,000 tons have to be removed per year. The common belief is that in this district one needs only to pick up diamonds from the ground. This is thoroughly dispelled by the fact that only 1 ct. diamond is found in 10 tons of grounds, a much smaller return than in other findings. In particular, the diamonds found here are not water repellent and have a surface film. This is removed by

(Courtesy of The E. J. Longyear Co.)

Core Recovered with Modern Equipment

a mixture of whale acid or fish acid in caustic soda. A new improvement is the continuous moving grease belt developed in the Diamond Research Laboratory.

The second speaker was Mr. R. D. Longyear, President of the E. J. Longyear Co. Mr. Longyear's paper comprised the sifted opinion of the American rock drillers and his own staff. When neglecting money devaluation diamond drilling costing $100 in 1938 had increased to $750 in 1951.

DEVELOPMENTS IN AMERICA

The American Government has embarked on a big mineral drilling programme, and drilling contracts for approximately $13,000,000 have been issued. Core storage is important, and some institutions establish core libraries. As an instance of this practice, a recent uranium mine would never have been opened, if the cores from an exploration were not available for inspection under ultra-violet light.

Recently the crystal growth of ice was studied by diamond drilling on a glacier. The equipment had to be flown in and out. Drilling for water, either in the horizontal or the vertical planes, is undertaken to remove conditions arising either from an excess of water or the lack of it. In mining,

(Courtesy of The E. J. Longyear Co.)

An American Core Storage Library

it is all-important to obtain prior information on water levels.

A further important factor in the overall drilling endeavour is the standardization of rock drilling equipment, and efforts in this direction had been inaugurated in the United States at the end of 1930. The resultant improvements led to the well-known CS 17 Standards. The latest development in this field is contained in the Bulletin 1 of the American Diamond Core Drill Association under the leadership of Mr. P. Adamson, who also participated in the symposium. There are some slight differences to the Canadian standards.

Mr. Longyear further described improved equipment, such as the development of drills on sleighs (landbarge), sideways mounting on trucks, and other applications. One of the outstanding achievements was better coring. A photograph was shown of a core (see opposite) which some years ago could not have been recovered, the increased efficiency having been made possible by the double core barrel.

There seems to be a necessity to establish Research Standards for items which should be uniform but which have not yet been sufficiently tested. The taper reamer bits in the AX and EX series were mentioned in this connection. Further methods to avoid the uncoupling of drill rods in the hole were recommended.

During 1951 approximately 14 holes of over 3,000 ft. depth were drilled in the United States as compared with one hole only in former years. The deepest hole drilled in the country reached 6,010 ft. Improvements on drills had been the addition of high pressure oil cylinders for feed lengths of 5 ft. and over, as well as hydraulic chucks.

The present scarcity of drill boart and the increasing price structure have brought the utilization of sintered carbide bits into a competitive range. In a mine known to the speaker, 40 per cent of the diamond bits had been replaced by sintered carbide bits. The measure proved the sintered carbide bits to be 1 to 1.5 times as speedy as diamond bits at one-third of the cost. Investigations on the development of synthetic diamonds were being carried out in the United States.

Fluid Solids for Roasting

The distinct benefits of the use of solids fluidization in the production of petroleum products by catalytic treatment was discovered by the Standard Oil Development Company during the years embracing the second World War. The product was the "Suspended Solids Technique," which has possibilities for solid-gas reactions outside the petroleum field. The Dorrco "FluoSolids" system is now utilized on a commercial scale in North America for the roasting of zinc and iron sulphides and arseno-pyrite gold ores, and has other applications. The new process is being introduced to Britain by the Dorr-Oliver Co. Ltd.

Catalysts have long been used in petroleum refining to assist in obtaining higher yields of the better-grade fractions of crude oil. In fixed-bed catalyst plants, however, carbon builds up on the catalyst and blinds the bed. This difficulty was successfully overcome by suspending the finely divided catalyst in an upward-flowing stream of gaseous reactants. The suspended mass behaves as a liquid; that is to say, it exhibits hydrostatic head, flows through pipes, and takes the shape of the confining vessel. Other important features of the "suspended solids technique," as it is known in the petroleum industry, are that the solid phase is homogeneous and uniform in temperature, while the heat transfer rates between solids and gas are almost infinite.

This principle has obvious possibilities for solid-gas reactions outside the petroleum field. In North America the Dorrco FluoSolids system is now being applied on a commercial scale for roasting arseno-pyrite gold ores, zinc sulphides and iron sulphides. Other applications which have been developed include limestone and dolomite calcination, the drying of granular non-metallic minerals, and the production of high concentration sulphur dioxide.

A NEW PROCESS

This very new process is being introduced to Britain by the Dorr-Oliver Co. Ltd., who have been associated with the mining and chemical industries for nearly half a century. Having specialized for many years in the Dorr Classifier and the Dorr Thickener, the Company has lately been broadening its activities. Among its most recent developments is the establishment of a pilot plant in Surrey for the Dorrco FluoSolids system. Similar equipment of British manufacture is obtainable from the company for pilot-size or commercial installations.

In the FluoSolids technique the solid, non-catalytic particles are partially suspended in the gaseous stream, the effect produced being almost exactly comparable to the sorting action in the column of a hindered-settling classifier. The gas velocities, however, are such that size segregation of properly prepared feed will not occur. The entire fluidized bed, which is in turbulent motion like a boiling liquid, is substantially uniform throughout. In order to create and maintain this condition, the feed must be crushed to such a size that the desired velocity of air stream will fluidize the bed. With most materials it has been found that the feed must be crushed to at least 4 mesh and sometimes as fine as 20 mesh. Suitable adjustment of velocity sizes will fluidize all particle sizes down to zero.

A FluoSolids reactor can handle the extremely fine sizes without too much carry-over, because the fluid bed acts to some degree at least as a filter which will hold back a portion of the fine sizes which might otherwise be carried out of the system. Ultimate dust loss of the system is entirely dependent on the degree of gas cleaning employed.

If heat is introduced, either with the gas or as a fuel with the solids, the fluidized bed, because of its violent movement, quickly reaches a uniform temperature throughout. This temperature can be accurately controlled by regulating either the amount of fuel, or the amount of excess air, or both, or by extracting heat from the fluid bed in the case of exothermic reactions. FluoSolids roasting or calcining differs from other types of roasters or calciners in that the amount of air or other gas introduced is under positive and exact control. The only air or gas that can get into the roasting chamber is that deliberately introduced through a low-pressure blower. Conditions in the roaster are thus under exact control. A desired stack gas analysis can be produced, so that a high CO_2 or SO_2 content can be obtained in burning lime or roasting sulphides respectively. Producer gas can be used for the magnetic roasting of iron ores, while chlorine is suitable for various chemical reactions.

Fluidized solids provide an efficient heat exchange mechanism. If reactors are provided with several compartments, one above the other, the fluidized solids can be allowed to overflow down transfer pipes between compartments. If the roasting or calcining compartment is next to the bottom, the hot gases on their upward journey fluidize each compartment in turn, giving up more and more of their sensible heat to the incoming raw feed. Similarly, the hot calcine overflows into the lower cooling compartment, where it is cooled by incoming cool air. This air is in turn pre-heated before entering the calcining compartment.

The introduction of gaseous fuel is a simple matter, since the gas is admitted through ports and burns in the excess air introduced to fluidize the bed. A suitable oil used as fuel may be injected into the fluid bed without atomizing in small spurts by means of a pump. Commercial size operating units have demonstrated that this is a highly efficient means of obtaining the combustion of fuel oil at low temperatures (1650°-1750°) and with little excess air. Powdered coal has been used successfully in a similar manner.

Multi-compartment reactors can be used for the magnetic roasting of iron ore. Reducing gas enters the bottom of the reactor, but only a portion of it is consumed in reducing the ore. The remainder burns in the upper compartments with air introduced through nozzles. This brings the raw ore up to reducing temperature. Magnetic roasting of iron oxides uses 750,000 to 1,000,000 Btu. per ton of feed, neglecting any heat recovered. About half of this amount, however, is recoverable. Of the iron units occurring as oxide, 92 per cent will be converted to magnetite. After suitable grinding, the calcine will yield a magnetic concentrate of as high, or higher, grade as obtainable with other methods of concentration.

A WIDE COMMERCIAL BENEFIT

Roasting of arseno-pyrite gold ores was one of the first commercial applications of FluoSolids. In Canada, a single-compartment reactor has been in use for five years, and two additional units have been operating for shorter periods on roasting arsenical gold ores. Another plant of this type is also operating at the new Golden cycle mill at Cripple Creek in Colorado, also for roasting gold ores. Close control of the reactor offers many advantages in using this single-compartment type in roasting sulphides. In roasting pyrite or pyrrhotite it is entirely feasible to produce a calcine having just the right amount of residual sulphur to furnish fuel for a subsequent sintering step. Moreover, the SO_2 content of the exhaust gas is usually high, 14 or 15 per cent being obtainable with pyrite. A

number of plants are now being erected in Canada and the U.S.A. to produce high strength SO_2 gas either for the manufacture of sulphuric acid or for the production of bisulphite cooking liquor commonly used by the pulp and paper industry in making sulphite.

For five years Cochenour Willans Gold Mines Ltd., of McKenzie Island, Ontario, have been roasting arseno-pyrite-gold concentrates before cyanidation in a single-compartment FluoSolids reactor. The ore is ground in water in the original grinding circuit and free gold is concentrated on jigs and corduroy strakes. The flotation concentrate is produced direct from the ore in the original flotation section and is roasted in the FluoSolids reactor. The reactor calcine is cyanided in the original cyanidation equipment.

The gold in the ore occurs in the free state and also in solid solution in arseno-pyrite. To a large extent the values in the latter cannot be extracted by cyanidation without roasting. Stibnite is common in the ore, along with pyrite, berthierite, and, in lesser amount, sphalerite and chalcopyrite. Before the introduction of the flotation section the total gold recovery was 78.6 per cent, of which 49.7 per cent was from cyanidation and 28.9 per cent from amalgamation. The flotation yielded an additional 13.6, and with improvement in the flotation operation, recovery was eventually raised to as much as 95.7 per cent overall.

The reactor has proved capable of converting a concentrate containing arseno-pyrite, pyrite, stibnite and gangue, from which gold could not be extracted economically, into a calcine from which the gold can be recovered economically by standard cyanidation methods and equipment. The reactor and its auxiliaries are of simple design and present no operating difficulties. The entire system has proved smooth and flexible, and can be shut down and started up with ease. The extremely close control of air input and temperature makes it possible to vary the types of oxides produced. The cost of operation has proved unexpectedly low and amounts to 29.7c. per ton milled. One man could operate the reactor and accessories with the minimum of effort. However, the reactor at Cochenour is separate from the main mill and two men are employed on each of the two shifts that the reactor operates. Investment costs are also lower than for comparative capacities of other types of roasters.

CLOSE TEMPERATURE CONTROL

Another important application is for zinc roasting, either to prepare a calcine for leaching or for retort zinc. Acid production is frequently a corollary objective, since usually SO_2 cannot be allowed to escape into the atmosphere. When electrolytic zinc is produced, roasting has as its principal aim maximum solubility of the zinc and of any cadmium present, with normally a minimum of zinc sulphate production. It is usually desired to obtain a calcine carrying 0.1 per cent sulphide sulphur and approximately 2.5 per cent of total sulphur, while maintaining solubilities of 90-95 per cent zinc. Solubilities are dependent on ferrite formation, especially on relatively high iron concentrates.

Close control of the temperature has been found essential to obtain maximum solubility, which by inference corresponds to minimum ferrite formation. Much closer temperature control is inherently possible with FluoSolids than with other types of roasting and correspondingly higher solubilities are expected. The SO_2 concentration in the gas will normally be about 11 to 12 per cent, which is excellent for contact acid manufacture. In making retort zinc the calcine is usually sintered in order to get maximum capacity from the retorts. Some of the sulphur from the concentrate can be left in the calcine to furnish sinter fuel.

Copper sulphides can be sulphatized with FluoSolids, making the copper water or weak-acid soluble. Calcines have consistently been obtained in which as much as 90 per cent or more of the copper is water soluble, with an additional 5 to 9 per cent soluble in sulphuric acid. At the same time, close temperature control allows only 1 to 4.0 per cent of the iron to go into solution. Two important applications are thus suggested. First, copper sulphide concentrate could be roasted, then leached, then treated electrolytically, by by-passing the smelter altogether.

The FluoSolids technique can also be used in drying materials such as sand, phosphate rock or any crystalline substance. At the same time a split at sizes between 35 and 100 mesh can be made if desired. The principles of operation of the sizer-dryer are the use of hot air to evaporate the moisture and the sizing of the feed by differential entrainment from a fluidized bed. By discharging the sized product at the bottom of the bed, short-circuiting is minimized and advantage is taken of the maximum possible scrubbing effect of the fluid bed. A unit for the continuous drying and sizing of dolomite, employing the FluoSolid technique, is operating on a commercial scale at Canaan, Connecticut, for the preparation of dry, dust-free rotary kiln feed. The removal and recovery of marketable fines from the feed gives an improved product and is saving fuel in the operation of the kilns.

A British Tractor and the World Market

A news report from the Information Division of the American Mutual Security Agency Mission to the United Kingdom has pointed out that twenty heavy duty caterpillar tractors of American manufacture recently left New York for Malaya. M.S.A. officials said that the American tractors and associate earth moving equipment were necessary because neither Britain nor Malaya had the comparable equipment capable of performing the planned large scale construction work.

That this latter viewpoint might have been premature was indicated by some of the revealing remarks made at the ceremony on April 23 which marked delivery of the first production model of the Vickers VR 180 Tractor. Speaking of the VR 180 as the joint product of the three British firms of Vickers Armstrongs, Rolls Royce, and Jack Olding, the Secretary for Overseas Trade, Mr. H. L. D'A Hopkinson, C.M.G., M.P., said he had been informed that compared with the nearest alternative of American production, the VR 180 had not only more special features which gave it increased efficiency, but weight for weight was more powerful and certainly it was faster.

The speaker had been informed that in 1953, provided supplies of material and labour were maintained, the tractors would be produced at a rate of 1,000 per year. This realization came at an opportune moment, for now Britain could supply an earth-moving unit that was at least the equivalent of any similar production in the world and had the added advantage of not costing dollars. The quick response from abroad was a happy augury, for already New Zealand, South Africa, the Rhodesias and the Anglo-Egyptian Sudan had placed orders and he had been told that Ceylon, India and Pakistan were about to do so. Confirmation from the United Kingdom Trade Commissioner in Canberra told that licences were to be granted for the import into Australia of up to 100 of the machines during the next twelve months.

When sufficient supplies and servicing facilities were available the VR 180 would enter the American market

Cost-Cutting Concreting at Swedish Mines

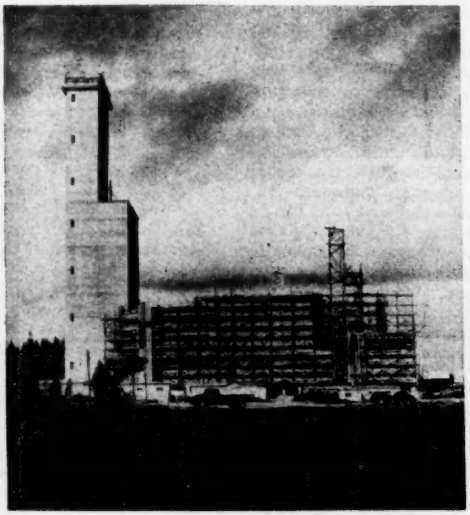
By JOHN GRINDROD

The author of the following article gives interesting details of a new method of slide-form concreting which has been adapted to pit head and mine shaft work in Sweden. The scope of the method has been greatly widened by the use of hydraulic jacks. Invented by two civil engineers and used by specialized contractors, the method has been adapted to meet the needs of the mining industry.

Claimed to give substantial labour-saving and cost-cutting results, a new method of slide-form concreting has been adapted to pit-head and mine-shaft work in Sweden. At the surface it has been used for the construction of pit-head buildings while in the shaft it has been used for the casting of walls.

Slide forms have been used for some time as a practical method of constructing certain monolithic structures, such as storage silos for coal, grain, slag, cement and other bulk materials; but, since the raising of the sliding form or mould has normally been carried out by hand-operated screws or jacks, it has been rather costly because of the labour involved. In addition, however carefully the form has been raised, it has often happened that the individual lifting tended to give an uneven movement which was accompanied by deformations and disturbance of the level of the form.

The new Swedish method, invented by civil engineers Emrik Lindman and E. von Heidenstam and now being used by a firm of specialized contractors, AB. Byggförbättring (Emrik Lindmans Ing. Byra) of Stockholm, under the supervision of civil engineer Sven-Erik Svensson, has sought to eliminate these disadvantages by the use of hydraulic jacks. This method has greatly widened the scope of the practical application of the slide-form principle in concrete construction and has made it available for many types of building and concrete work. Examples of the way this has been adapted to the mining industry include the pit-head building shown in the illustration, which has been erected for Bolidens Gruv. AB., Stockholm, one of the biggest mining companies in Sweden, and the casting of shaft walls at the Kiruna mine.



Pit head building during erection for Bolidens Gruv A.B.

The hydraulic jacks used in the system are oil-operated and, because they climb upward on 25 mm. smooth iron vertical rods embedded in the concrete, are known as "climbing monkeys." All the jacks or lifters are connected by a system of pipes to a small electric oil pump, and, no matter how many jacks are used, only one man is needed to tend the pump and the hydraulic system. This man looks after the entire lifting process, checking the level of the form as it climbs the rods.

For the slide-form casting of larger concrete structures, into which category fall pit-head buildings, the hydraulic lifters are used in combination with standardized steel form-yokes. The forms themselves are made of wood and are suspended in the yokes. They can be made very simply thanks to the uniform and simultaneous lifting at all the jacks. This simplified structure of the form helps in the saving of materials.

Normally tongued-and-grooved planed boards 1¼ in. or 1½ in. x 4 in. are used and these are held together by horizontal frames running along the top and bottom of the forms. The frames are made as a rule of 3 in. x 6 in. deals on the flat for straight walls, and double, bolted 2 in. x 8 in. or 10 in. deals for circular walls. The vertical legs of the yokes clamp the frame and take the pressure of the concrete, as it is poured from the form itself.

The yokes take up little space and this leaves plenty of room for the working platform which spans the area of the building between the edges of the form and from which the concrete is poured. The working platform is usually built level with the upper edge of the form and hoisting equipment can often be built direct on to the form itself. The same type of lifting mechanism can be used regardless of the shape of the structure and the thickness of the walls.

When the walls have been cast, the same platform can be used as a level form for the top floor-structure. This having hardened, the platform can be lowered to be used in the same way at each floor level. This gives an added advantage in that the lower floors can be cast protected from the weather by the top floor.

Where the method is used for the concrete facing of mine shafts, the steel rods up which the working platform will climb, are placed in the required positions round the walls of the shaft. The working platform covers the whole of the shaft area between the edges of the form on which it lies flush. As the jacks raise the platform the concrete is poured into the space between the form and the wall, the speed of lifting being at such a rate as to allow the concrete to set sufficiently to hold in place. The concrete itself can be delivered to the working platform through a jointed pipe which is made to reach all four walls of the shaft. Alternatively, the concrete can be barrowed to the walls from a central point. Above the main platform is a secondary platform from which all abnormal depressions in the wall can be made good as the outfit ascends.

The operational factors involved in using this method of slide-form concreting are not in themselves complicated, and the fact that the method can be utilized for surface or underground construction work may see its adoption in the mining industry in other parts of the world. It is, perhaps, of added moment that the new method has been accepted for construction work by one of the largest of Sweden's mining companies.

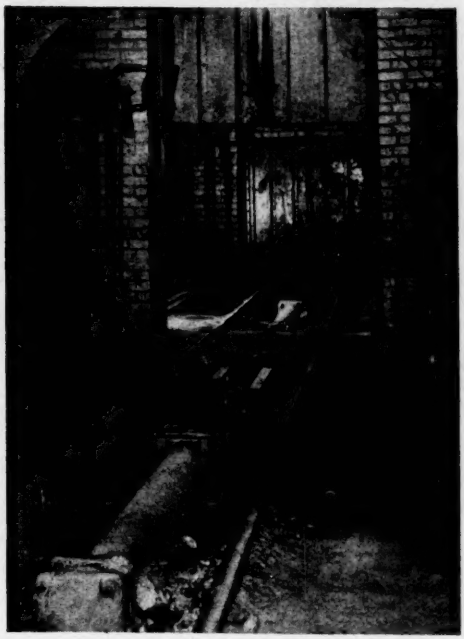
MACHINERY AND EQUIPMENT

The Westinghouse Combined Stop and Restarter

In order to provide a resilient form of stop, the Westinghouse Brake and Signal Company some years ago introduced a combined stop, retarder and restarter for use with colliery tubs. The combined stop was primarily intended for use with single tubs, but a larger type has now been introduced. This latter type has been produced for utilization with heavier and larger tubs or mine cars.

In its entirety, the equipment comprises a large double acting cylinder, to the piston tube of which is fitted a cross-head carrying a substantial stop. This is designed to engage the axles of tubs and the axles or dummy axles of mine cars. The double acting cylinder is very similar to the decking rams manufactured by the Company, which are a familiar piece of underground equipment. A pair of spring loaded pushing arms complete the entire new retarder unit.

The crosshead is carried on two rollers in the case of the mine car type, and on a single roller in the tub variety. Both supports are claimed to be substantial and are designed for heavy and continuous wear. The rollers run in guides so designed and shaped that the stop attached to the crosshead is made to be carried below axle level as the piston reaches



8 in. unit at Nantgarw Colliery, pit bottom air lock

the forward extremity of its travel. The pushing arms remain in contact with the axle and, as in the case of ordinary decking rams, are spring loaded and can be depressed by axles moving forward over them.

The unit has a threefold application to the mining engineer. It is effective as a retarder when the interval between the arrival of successive tubs or cars allows the proper resetting of the piston between each arrival. With the equipment at rest, both ends of the cylinder can be arranged to be at atmospheric pressure, and the degree of retardation is varied by so throttling the exhaust that the air pressure in the cylinder rises as the piston is drawn out by the passing vehicle.

After this passage is completed, air to retract the piston to the normal position is fed to the front end of the cylinder. It is usual to exercise control by means of a hand control valve for this application, with the operator stationed near the apparatus. By a combination of this method and the skill of the operator, it is presented as possible to obtain a fine degree of control over the vehicle.

The second application is to regard the unit as a resilient stop for heavy tubs or mine cars in cases where the speed or weight or a combination of both speed and weight to be controlled would be too great for other standard control gear. For this application air is supplied to the front end of the ram cylinder in order to provide a cushion of air during the period in which the vehicle is being brought to rest. On exhausting the air from the cylinder the vehicle is thus released, and is allowed to continue on its travelling way by the force of gravity.

For this application the air supply is required to be both adequate and unfailing in its provision, as lack of air would render the stop useless. In cases of this nature when doubt may be present as to the reliability of the existing air supply, it is usual to provide a reservoir fed through a non-return valve. This is situated adjacent to the retarder and is piped in such a way that there is always a supply of air that is adequate to bring a tub to rest.

In addition, it is usual to provide a pressure gauge, the latter serving to bring to the notice of the operator any fluctuation of air supply. A report to the responsible official can thus be made if the pressure falls to a dangerous level.

As an alternative to this safety device or for use in conjunction with it, an audible warning of a state of low pressure can be provided. It is also possible to arrange that in the event of an air supply failure sufficient air is available for the effective operation of the equipment for one stop. After this period some fixed stop, for example a pair of skotch blocks, can automatically be brought into use for the arrestation of following tubs. It is natural to suppose that the exact type of emergency equipment used will be dictated by the local circumstances prevailing, with each individual case decided on its own merits.

The third use of the device is as a ram for mine cars or tubs. By the application of air to the front end of the cylinder, the vehicle may first be brought to rest without undue shock. Subsequently the front end is vented and exhausted to atmosphere and air is supplied behind the piston. By this method of initially bringing the first vehicle to rest followed by a re-acceleration the same thrust may be given to following vehicles thus facilitating subsequent control.

Several methods of control of the apparatus are said to be available, with local conditions determining the most effective for any particular use. Thus the combined stop can be arranged for fully automatic operation where the vehicles may arrive in regular numbers, by means of vehicle actuated air valves or treadles, or alternatively, by a hand control valve.

A New Mobile Crane

On May 1 the British Railways Executive arranged for a special committee, comprising the chief mechanical electrical engineers of all regions of British Railways to attend a demonstration of the new Staffa 2-3 ton mobile crane. Constructed on the understanding that a mobile crane must be robust, simple in operation and smooth in manoeuvrability, the Staffa 2-3 ton mobile crane has a special jib construction for three ton lifting, and is manufactured to British Standard specification 1757 : 1951. It is said to be capable of turning within its own length and is equipped with standard car type controls, which enables the unit to be operated by drivers with a minimum of training. Hydraulic luffing ensures smooth control from the driving position and construction is on the unit principle for the rapid replacement of major parts.

Lifting data shows a radius of 10 ft. single fall with a clear lift above ground of 7 ft. and a rope extension below ground of 29 ft. The various single fall radii terminate at 3 ft. with a clear lift above ground of 19 ft. and a rope extension below ground of 19 ft. At 2 ft. 6 in. outreach, 3 tons can be raised.

METALS, MINERALS AND ALLOYS

Mr. Manly Fleischmann of D.P.A. has given details of the U.S. consumption of metals for current military and atomic purposes. The highest proportion is for cobalt, 73 per cent, followed by 70 per cent for nickel and 55 per cent for magnesium. Two-fifths of all the aluminium in the U.S., one-third of the copper and one-fifth of the steel available are to be used in this way.

The steel dispute is now dragging its way through the courts. No decision can be expected in the immediate future, for after the court has heard the oral arguments it will have to study the documents lodged by the Government, the union and the employers. Meanwhile, the Steelworkers' Union is threatening to start a new strike if the W.S.B. recommendations are not promptly implemented by the industry; and both Vice-President Barkley and Mr. Tobin, Secretary of Labour, have made public statements forcibly underlining the Administration's sympathy with the union in the dispute.

COPPER.—After a strike lasting for more than a fortnight, the 10,000 employees at the Anaconda copper mines at Chuquicamata and Potrerillos have gone back to work. President Gonzalez presided at a meeting between the two sides. He gave an award of 35 pesos per day to the men and the companies immediately accepted this decision. A number of smaller points remain to be settled: the duration of the agreement, the size of family allowances and how far back the agreement shall be dated. The men, in an endeavour to recover lost production will now work on holidays.

This settlement of the strike seems to have preceded any definite decision regarding the price payable for Chile's copper. No unnaturally, the air is thick with rumours. Sources of information in Santiago state that the U.S. is willing to pay 33½c. per lb. for the whole of Chile's production. This compares with 27½c. per lb. under the agreement abrogated some days ago. Other sources in Chile have suggested that several European countries have offered to buy copper at the equivalent of 40c. per lb. Three countries in particular have been named: France, Belgium and Holland. London has accepted this report with reserve, for the Dutch are said to be uninterested in copper at 36c. per lb. If the offer has indeed been made, it is likely to have been on behalf of one of the Iron Curtain countries. Canada is also reported to be bidding for 2,000 tons.

The Chilean Central Bank has decided not to publish information concerning operations in the copper markets. These details have, however, a way of leaking out. Though the Bank refuses to state its policy, it is understood that future bids for copper will be studied by the Bank. These bids would be considered in the light of market conditions and the balance of payments position with the country concerned. After approving the bid, the Bank would authorize the companies to deliver the copper, and the Bank would pay the company 24½c. per lb. The Government would take the remainder. No agreement seems to have been reached over the rate at which such a price could be convertible into pesos. This problem was one which was being discussed when the old agreement between the U.S. and Chile was abrogated.

The average price of all U.S. refined copper exports during 1951 was 26.9c. per lb. As the U.S. has been paying 27½c. per lb. for imported copper since last May, the subsidy has apparently been coming from the domestic producers.

LEAD.—Further cuts have been made in the price of lead. The New York spot price was reduced by one American producer by 2c. per lb. to 15c. The others quickly followed suit and the Ministry of Materials announced a reduction of £16 per ton in the official price. This is now £131 per ton. The question of re-imposing the U.S. import duty now seems to be definitely settled and it only remains for the machinery to be set in motion.

TIN.—According to reports from New York, the U.S. Reconstruction Finance Corporation has agreed to purchase a small quantity of tin from the medium producer's group of Bolivian tin companies. It will be recalled that, according to other reports, this group is not to be nationalized. If this sale takes place it will be the first purchase of Bolivian tin concentrates since last summer.

The concentrates involved are believed to be part of those which have been accumulating at the Chilean ports for dispatch when the price dispute has been settled. The report adds that the price was 121½c. per lb., the equivalent of that agreed with the other main tin producers. Although no amount has been mentioned the quantity is likely to be quite small.

ZINC.—The suspension of the steel strike in the U.S. has led to an increase in the demand for prime western zinc. High grade zinc continues to move slowly, but there is still sufficient demand for most observers to dismiss the possibility of an early price cut in this grade.

April saw a slight set-back in the production of slab zinc in the U.S. from the high levels of the previous month. The April production of 83,011 s.tons (85,028) was made up of 39,289 s.tons of Prime Western, 25,435 s.tons of special high-grade, 16,059 s.tons of high grade and 2,228 tons of intermediate. Shipments of slab zinc in April were virtually the same as in March: 85,592 s.tons against 85,575. The tonnage sent to the domestic market fell from 80,121 s.tons to 73,818 s.tons. The export market took a larger quantity at 8,021 s.tons (5,051) and the deficiency caused by the very low shipments on government accounts of March (403 s.tons) was more than made up by the April shipment of 3,753 s.tons. As a consequence of the shortfall in production and the increases in exports and government orders roughly balancing the lower domestic consumption, stocks at the end of April at 23,423 s.tons were smaller than at the end of March.

A modern plant for the production of zinc has been opened at Nossa, north-east of Milan. This plant will increase Italy's capacity for producing zinc and will, presumably, lead to a decrease in the amount of ore exported for treatment in Germany, Belgium and France.

ALUMINIUM.—Production of aluminium by Norway's state-owned plant amounted in 1951 to 24,567 tons of pure aluminium. During the year 26,011 tons of aluminium were exported, about one-third, 8,820 tons, being exported to Aluminium Union in payment for oxide delivered.

Dutch Guiana, the world's greatest producer of bauxite, will start producing aluminium if the report of a special mission is accepted. The suggested programme will cost $53,000,000 and will cover ten years. The mission states that it sees no reason why reasonably cheap hydro-electric power should not be generated locally to convert the bauxite into aluminium. The programme includes the expansion of bauxite up to an annual rate of 3,000,000 tons.

In order to relieve hardship cases resulting from low second quarter allocations and to increase essential production, N.P.A. recently released 23,500 s.tons of aluminium in six weeks. In announcing this release, Mr. Fowler, the administrator, asked manufacturers to return unusued allocations for re-distribution.

ANTIMONY.—As expected, the British price of antimony has been reduced this week. English Regulus delivered 99.6 per cent is now £282 10s. per ton against £317 10s. Other types of antimony have also been reduced by £35 per ton. The price of crude antimony has been reduced by £20 and antimony oxide by £30.

TUNGSTEN.—Recent trade reports that foreign tungsten ore has been available at the Atlantic ports under $60 per unit have been confirmed by G.S.A. stating that it is buying below his figure.

GOLD.—The output of gold from the Transvaal and the Orange Free State in April amounted to 963,436 f.oz. as compared with 981,561 f.oz. in March.

The Western Australian output of gold in March was 52,892 f.oz.

SILVER.—The London and the New York prices have again declined this week by 1d. and 1c. respectively and now stand at 75d. and 86c.

The London Metal Market

(From Our Metal Exchange Correspondent)

Dealings in tin on the London Metal Exchange have again been of a restricted nature and the undertone has been weaker than of late, but it is considered that a major price recession is unlikely as it is expected the U.K. Government will support the market in Singapore for as long as possible in view of the very sharp decline in the rubber price. In the U.S. there appears to be a growing conviction that as soon as the new Bolivian Government is recognized a satisfactory solution will be found to the present deadlock over a new tin ore contract, as stocks of concentrates at the Texas smelter are known to be running low, and it is doubtful whether the intake from other directions can be materially increased.

As was foreshadowed last week a further reduction in the lead price has taken place bringing the level in the States down to 15c. per lb., and it is now certain that an import duty will be reimposed early in June, and this in turn may have the effect of further depressing the European price by another £5 to £10 per ton. Although the Ministry of Materials has adjusted its price to each reduction in the E. & M. J. quotations, its present level of £131 per ton is still some £20 per ton higher than the general sterling prices ruling elsewhere. It is hoped that the present U.S. quotation will be maintained as it appears Customs smelters in the U.S. are now prepared to take in some lead even if they cannot make corresponding sales.

The zinc market is still featureless with buyers becoming more difficult to find, and a reduction in the price seems certain although its timing may be affected by the existence of the I.M.C. and its second quarter allocations. The Ministry of Materials price in the U.K. is, however, far too high by any standard and it is hoped that an appreciable cut will be made without waiting for any movement in the official E. & M. J. quotation.

The copper market is featureless with traders awaiting a clarification of the Chilean sales policy.

On Thursday the official close on the tin market was: Settlement price £957 10s., Cash Buyers £957, Sellers £958. Three months' Buyers £954 10s., Sellers £955. In the afternoon the market was firmer. Turnover for the day was 120 tons. Approximate turnover for the week was 575 tons.

The Eastern price on Thursday morning was equivalent to £970 12s. 6d. per ton, c.i.f. Europe.

Iron and Steel

The widening of the trade gap in April carries with it ominous implications. To rectify the balance, more steel will probably be allocated for export, and as rearmament is also imposing heavier demands upon the steel industry, other consumers may fare badly. The squeeze in fact is already acute. Supplies to the motor industry are stated to be 250,000 tons short of requirements; shipbuilding operations are slowed down because of the smaller tonnages delivered to the shipyards, and allocations to the railways and even the collieries are on a reduced scale.

Most of these difficulties stem from the continued scarcity of raw materials. Coke supplies are barely sufficient to keep the 102 operative blast furnaces in full production, and until more fuel is available additional units cannot come into production.

Home production of iron ore is rising and in Cleveland where the miners have been conceded an extra week's holiday with pay, the men have agreed to restrict their vacation this year to a single week in return for an additional week's wages in order to sustain production.

Imports of foreign ore are also on a better scale, but still fall short of requirements as to quantity and quality whilst the shrinkage in the arrivals of foreign scrap still continues. In the face of all these difficulties the steel makers are still unable to attain maximum outputs and non-priority consumers are severely rationed. Hopes of improvement before the end of the half year have been abandoned, and the extent of the allocations in the third Period, seems to be largely dependent on a settlement of the U.S. steel dispute, the successful outcome of which would enable the bulk shipment of American steel to British ports.

MAY 15 PRICES

COPPER

Electrolytic ... ... £231 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid ... ... £131 0 0 d/d
Soft empire, including secondary lead ... £131 0 0 d/d
English lead ... ... £132 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid ... £190 0 0 d/d
G.O.B. spelter, domestic... ... ... £190 0 0 d/d
Electrolytic and refined zinc ... ... £194 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over ... ... £270 per ton
Crude (70%) ... ... £240 per ton
Ore (60% basis) ... ... 32s. 6d. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) ... ... £454 per ton

OTHER METALS

Aluminium, £154 per ton.
Bismuth, 25s. lb.
Cadmium, 18s. 3d. lb.
Chromium, 6s. 5d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £65 oz. nom.
Magnesium, 2s. 10½d. lb.
Osmiridium, £35 oz. nom.
Osmium, £70 oz. nom.
Palladium, £8 10s. oz.
Platinum (scrap), £33.
Platinum, £27/33 5s. nom.
Rhodium, £45 oz.
Ruthenium, £30 oz.
Quicksilver, £73 ex-warehouse.
Selenium, 25s. nom. per lb.
Silver (bar), 75d. f.oz. spot and forward.
Tellurium, 19s. lb.

ORES, ALLOYS, ETC.

Bismuth ... ... 50% 10s. lb. c.i.f.
40% 9s. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 per ton c.i.f.
" " (concentrates) £13 per ton c.i.f.
" " Refractory £12 12s. per ton c.i.f.
Baluchistan Metallurgical ... £14 16s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... ... £10 - £11 d/d
Molybdenite (85% basis) ... 103s. 1½d. per unit c.i.f.
Wolfram (65%), U.K. ... 485s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture) ... 35s. nom. per lb. (home)
Ferro-tungsten ... ... 33s. nom. per lb. (home)
Carbide, 4-cwt. lots ... ... £30 3s. 9d. d/d per ton
Ferro-manganese, home ... £43 15s. 2d. per ton
Brass Wire ... ... 2s. 8¼d. per lb. basis.
Brass Tubes, solid drawn ... 2s. 1½d. per lb. basis.

U.K. PRIMARY METAL STATISTICS—MARCH

(long tons)

	Refined Copper	*Lead†*	*Slab Zinc*	*Tin Metal*
Stocks in U.K. Mar. 1				
Government	56,776	85,637	32,232	200§
Consumers	23,838	18,569	14,846	5,168‖
Imports	18,144	14,523	18,227	546
Production	14,563	8,136	6,157	1,358*
Consumption	28,754	16,025	16,148	1,907
Exports and Re-exports	15	28	15	6,732
Stocks in U.K. Mar. 31‡				
Government	55,265	92,954	35,751	200§
Consumers	24,090	17,644	17,638	4,303‖

(Source: British Bureau of Non-Ferrous Metal Statistics)

* Estimated by International Tin Study Group.

† Includes imported virgin lead and English refined from domestic ore and secondary metal.

‡ In addition, U.K. stocks of blister copper at the end of March were 24,166 tons; of zinc concentrates were 39,872 tons and of tin in ore were 4,666 tons.*

§ Excluding strategic reserves.

‖ Including tin in official warehouses but excluding smelter carry over.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The rally of gilt-edged at the beginning of the week was short-lived and prices again fell away, ending in stagnation. On Wednesday dealings opened for the new three week account. The trade gap deteriorated in April and the adverse balance rose to £96,100,000 as against £68,000,000 in March. Export figures are down and import restrictions by some of our best customers present a serious situation. The E.P.U. settlement for April showed a deficit of £20,200,000 compared with just under £23,000,000 in March. Eighty per cent of this had to be settled in gold. If the drain continues at this rate, the U.K. will shortly have to settle 100 per cent in gold. Market interest mainly centred on the Distillers Note issue which was one of the most heavily stagged operations in recent years and was many times over-subscribed.

Coppers had a bad week. Stock markets always try to anticipate events some time ahead and there has been a feeling that copper may before long follow other commodities downwards. The market was very touchy with a preponderance of sellers. Tanks were the exception; the price of the shares remained steady on rumours that an interim dividend might be forthcoming this year. The Union Minière announced a total dividend for 1951 of 1,000 Belgian francs net against 750 for 1950.

The lead/zinc market suffered from selling by nervous holders. The U.K. price of lead was cut during the period by £16 per ton and now stands at £131 per ton. Consolidated Zinc announced an increase in profits of £2,500,000 and the dividend was raised by 7½ per cent to 20 per cent. The company is clearly following a cautious policy in view of falling commodity prices. In this connection the statement by the chairman of Rhodesia Broken Hill is of considerable interest. He described the company's profits last year as "abnormal" and said that the current year's operations are likely to show a smaller profit although he thought it would still prove satisfactory. North Broken Hill are paying a final dividend of 1s. 6d. sterling, making 2s. 6d. per share for the year against 1s. 6d. in 1950.

Tin issues also fell away although the price of metal has only slightly eased. In some quarters this is considered illogical, but it seems clear that investors in this market are still affected by the fall in the price of rubber. While there is no obvious direct connection between the two commodity prices, unsatisfactory plantation wages in Malaya at this juncture could considerably upset much of the good work which has recently been done and this would also affect tin mines.

Kaffirs were one of the few bright spots in the Stock Exchange. The last account was the best for a long time although there was naturally some profit-taking towards the end. There was rather more optimism in London than in Johannesburg over the political situation. No support was reported from Paris. The Ellaton development values of 1,262 in.-dwt. at a depth of 330 ft. aroused great interest. The property lies immediately north-west of Western Reefs. The principal shareholders are East Rand Extensions, Strathmore Exploration, Anglo American Corporation and Anglo Transvaal Consolidated. Western Reefs and New Pioneer also went ahead on the news.

Orange Free State-ers were also good, most of the developing mines recording considerable gains. Buying of Virginia ordinary shares for American account was also reported.

West Africans, after early improvements, lost most of their gains. The Gold Coast Chamber of Mines announced that an approach for increased wages and salaries has been made. The mines are reported to have made substantial offers which have been accepted. These will undoubtedly lead to another rise in working costs.

Diamond shares were unsettled following the reduced interim dividend announced by Casts. The company is paying 20 per cent against 25 per cent last year.

International Nickel earnings for the March quarter of 1952 were equivalent to $1.08 per common share. This compares with $1.14 for the previous quarter and 97c. for the first quarter of 1951.

FINANCE	Price May 14	+ or − on week
African & European	2½	+⅛
Anglo American Corpn.	6¾	−⅛
Anglo-French	19/6	.....
Anglo Transvaal Consol.	28/9	.....
Camp Bird	10/10½	−1½d
Central Mining (£1 shrs.)	35/7½	+1/10½
Consolidated Goldfields	46/10½	.....
Consol. Mines Selection	26/10½	.....
East Rand Consols	3/3	.....
General Mining	4½	.....
H.E. Prop.	31/10½	−7½d
Henderson's Transvaal	11/-	−6d
Johnnies	3⅛	.....
Rand Mines	4¾	+⅛
Rand Selection	38/9	.....
Union Corporation	8⅛	+½
Vereeniging Estates	4½	.....
Writs	30/7½	+7½d
West Wits	44/6	+9d
RAND GOLD		
Blyvoors	40/6	+1/9
Brakpan	18/1½	+1½d
City Deep	33/9	.....
Consol. Main Reef	33/9	+7½d
Crown	46/3	−1/3
Daggas	3⅛	+⅛
Dominion Reefs	2/-	.....
Doornfontein	23/9	+3d
Durban Deep	3⅛	+⅛
E. Daggas	21/3	.....
E. Geduld ... (4/- units)	42/6	+7½d
E. Rand Props.	3½	+⅛
Geduld	6⅛	+⅛
Grootvlei	33/6	+1/-
Libanon	13/3	+6d
Luipaards Vlei	18/3	+3d
Marievale	21/3	+1/-
Modderfontein B.	5/6	.....
Modderfontein East	27/6	.....
New Kleinfontein	30/10½	+1/3
New Pioneer	14/-	+1/-
Randfontein	19/-	+1/6
Robinson Deep	11/9	.....
Rose Deep	27/6	.....
Simmer & Jack	6/3	+3d
Springs	8/-	.....
Sub Nigel	2⅛	+⅛
Van Dyk	11/3	+3d
Venterspost	21/6	+3d
Vlakfontein	17/3	−1½d
Vogelstruisbult	25/9	+1½d
West Driefontein	6½	+¼
W. Rand Consolidated	48/9	+3/9
Western Reefs	41/10½	+1/10½

O.F.S	Price May 14	+ or − on week
Alpha F.S.A.	6/3	.....
Blinkpoort	16/10½	+7½d
Central Mining F.S.	4/-	+9d
Freddies	7/3	−3d
Freddies N.	6/3	−3d
Freddies S.	8/3	−1½d
F.S. Geduld	2¾	+⅛
Geofries	17/6	.....
Harmony	19/4½	+7½d
Lydenburg Estates	10/3	+10½d
Middle Wits	15/7½	+1½d
Ofsits	40/-	+1/10½
President Brand	18/3	+1/4½
President Steyn	18/3	+1/4½
St. Helena	17/3	−3d
U.F.S.C. & G.	7/6	+1/-
Virginia Deb.	7/3	.....
Virginia Ord.	11/7½	+1/9
Welkom	30/-	+1/3
Western Holdings (New)	3½	.....
WEST AFRICAN GOLD		
Amalgamated Banket	1/6	.....
Ariston	5/7½	+1½d
Ashanti	19/3	+6d
Bibiani	7/-	+3d
Bremang	2/6	.....
G.C. Main Reef	3/1½	−1½d
G.C. Selection Trust	6/6	+4½d
Kononga	2/3	+1½d
Kwahu	3/6	−3d
London & African Mng.	1/4½	−1½d
Lyndhurst Deep	1/3	+1½d
Marlu	1/4½	.....
Nanwa	5d	.....
Taquah & Abosso	4/-	+1½d
AUSTRALIAN GOLD		
Boulder Perseverance	2/3	.....
Gold Mines of Kalgoorlie	9/9	.....
Great Boulder Prop.	5/6	.....
Great Western Consol.	6/10½	.....
Lake View and Star	16/9	.....
Mount Morgan	16/-	−6d
North Kalgurli	13/-	−3d
Paringa	6d.	.....
Sons of Gwalia	10/-	.....
South Kalgurli	8/4½	.....
Western Mining	7/3	−1½d
Wiluna	5/7½	.....
MISCELLANEOUS GOLD		
Cam and Motor	39/4½	.....
Champion Reef	7/-	.....
Falcon Mines	7/10½	+1½d
Globe & Phoenix	25/3	.....

MISCELLANEOUS GOLD (contd.)	Price May 14	+ or − on week
G.F. Rhodesian	6/3	+3d
London & Rhodesian	4/9	.....
Motapa	1/7½	.....
Mysore	4/-	.....
New Guinea	1/3	−1½d
Nundydroog	8/3	+3d
Ooregum	2/9	.....
Oroville	11/-	.....
St. John d'El Rey	26/-xd	−2/1½
Zams	35/9	−1/9
DIAMONDS		
Anglo American Inv.	4¾	−⅛
Casts	28/3	−5/6
Cons. Diam. of S.W.A.	3½	−½
De Beers Defd. Bearer	61/-	−4/6
De Beers Pfd. Bearer	14⅜	−⅛
COPPER		
Chartered	52/-	−3/-
Indian Copper	3/7½	.....
Messina	3⅛	−⅛
Nchanga	6½	−⅛
Rhod. Anglo-American	52/-	−4/6
Rhodesian Selection	14/-xd	−1/4½
Rhokana	18⅝	−1½
Rio Tinto	£19½	−£1
Roan Antelope	11/-xd	−1/1½
Selection Trust	38/9	−2/-
Tanks	57/-	.....
Tharsis Sulphur Br.	31/3	−2/6
TIN (Eastern)		
Anglo-Burma	2/9	.....
Ayer Hitam	24/-	−1/-
Bangrin	7/9	−1/-
Gopeng	10/7½	−10d
Hongkong	7/3	−9d
Ipoh	21/3	−1/3
Kamunting	10/4½	−10½d
Kepong Dredging	7/-	−7½d
Kinta Tin Mines	14/3	−3d
Kramat Pulai	4/10½	.....
Malayan Dredging	23/-	−3d
Pahang	14/3	−3d
Pengkalen	8/6	−9d
Petaling	13/3xd	−1/-
Rambutan	22/6	.....
Siamese Tin	20/9	−9d
Southern Kinta	13/6	−1/-
S. Malayan	24/-	−6d
S. Tronoh	16/3	−9d
Sungei Kinta	17/6	.....
Tekka Taiping	8/1½	−7½d
Tronoh	22/9	−1/6

TIN (Nigerian and Miscellaneous)	Price May 14	+ or − on week
Amalgamated Tin	8/10½	.....
Berait Tin	20/-xd	−3/3
Bisichi	3/4½	+1½d
British Tin Inv.	15/7½	−7½d
Ex-Lands Nigeria	4/7½	.....
Geevor Tin	12/3	−3d
Gold & Base Metal	3/3	−3d
Jantar Nigeria	5/3	+3d
Jos Tin Area	10/9	.....
Kaduna Prospectors	4/-	.....
Kaduna Syndicate	5/3	.....
London Tin	5/4½	−3d
Ribon Valley	1/-	.....
United Tin	2/1½	−1½d
SILVER, LEAD, ZINC		
Broken Hill South	42/6	−6d
Burma Mines (3/6 sh.)	1/9	−1½d
Consol. Zinc	24/-xd	−1/4½
Lake George	14/3	−9d
Mount Isa	33/9	−1/3
New Broken Hill	23/6xd	−9d
North Broken Hill	57/6	−6d
Rhodesian Broken Hill	14/3	−9d
San Francisco Mines	31/-	−1/6
Trepca	3/4½	−1½d
MISCELLANEOUS BASE METALS & COALS		
Amal. Collieries of S.A.	44/4½	.....
Associated Manganese	38/9	−1/3
Chinese Engineering	4/-	.....
C.P. Manganese	49/4½	−1/7½
Natal Navigation	3½	−⅛
Wankie	15/3	−9d
Witbank Colliery	2⅛	.....
CANADIAN MINES		
Hudson Bay Mining	$98	−$3
International Nickel	$78	−$1⅛
Mining Corpn. of Canada	£5½xd	−£1
Noranda	$141	+$5
Quemont	£7⅛	−$⅛
OIL		
Anglo-Iranian	5⅛	−¼
Apex	42/6	−7½d
Attock	22/6	−1/3
Burmah	67/6	−1/3
Canadian Eagle Bearer	34/3	−10½d
Mexican Eagle	22/6	.....
Shell	4⅜	−⅛
Trinidad Leasehold	30/9	.....
T.P.D.	27/6	−1/10½
Ultramar	29/9	−2/3

COMPANY NEWS AND VIEWS

Chartered Company's Strength

Until last autumn, the British South Africa Co. (Chartered) contented itself with paying one dividend a year, but fresh ground was broken in October when an interim of 13-⅓ per cent was declared. This conveyed the impression that trading results for the year to September 30, 1951, had been good, and this has proved to be so. The total distribution has been stepped up to 40 per cent against 33-⅓ per cent out of net profits of £2,723,209.

The largest slice of the company's income comes from royalties paid by the Rhodesian copper producers on their sales which last year jumped from £3,004,857 to £5,500,771. Further substantial revenue is derived from actual shareholdings in the copper and other companies, while another source of income is from a variety of interests in Southern Rhodesia, rents and fees, land receipts and profit from estates. A large interest is held in Rhodesia Railways Trust, from which the company receives revenue, as also from the operations of subsidiary companies associated with food, milling, etc. Investments have been well chosen and added to during the year from £8,977,443 to £9,128,972, while the market value of those quoted at the end of September last was £12,763,563. The portfolio includes British and Dominion Government securities, Foreign Bonds, Rhodesian and other mining company shares, together with miscellaneous holdings.

This variety of interests enabled the company to make a gross profit last year which represented an increase of nearly 80 per cent on the previous year, while after all charges there was a net profit which was nearly double that for 1950.

	1950	1951
Group profits	£3,739,134	£6,546,302
Taxation	£2,165,218	£3,781,231
Net profit	£1,460,742	£2,723,209
Dividend cost	£1,204,569	£1,379,779
,, per share	5s. 0d.	6s. 0d.
Con. Balance Sheet investments	£13,359,225	£13,419,642
,, ,, Cash	£1,303,220	£3,676,065
,, ,, Debtors and tax certs.	£1,475,528	£2,487,617
,, ,, Current liabilities	£3,371,240	£4,861,959
,, ,, Reserves	£7,930,798	£9,806,100

Gold, Oil and Industrial Interests of Central Mining

The good impression created by the preliminary figures of the Central Mining & Investment Corporation, given in our issue of May 2, is fully borne out by the full Report for the year ended December 31, 1951. Group profits increased last year by £252,910 to £1,007,800 but after providing more for taxation—£587,458 against £326,530—the balance profit available was £419,838 compared with £426,959. The Ordinary dividend of 2s. 4½d. per £1 share was maintained and absorbed £249,375.

As one of the oldest and firmly-established of the Rand mining-finance houses, the Corporation has a number of gold producers under its control which may be expected to remain remunerative for many years. In the newer goldfield of the Orange Free State it is less prominently represented, though it has a spread of shareholdings and has under its aegis the Harmony Gold Mine which is engaged in shaft sinking and anticipates intersecting the Basal reef about the middle of the current year. On the Far Western Rand it has been responsible for the successful Blyvoor. This, with other newer mines in which it has become interested—Vogelstruisbult, St. Helena, Western Holdings, etc.—helps to offset the decline of the group's Rand producers now in the sere and yellow leaf, New Modder, Modder B, etc. In mining-finance, the Corporation's spread gives it indirect interest in Australian lead-zinc and Rhodesian copper. Coal mining is represented by holdings in South African Coal Estates, Transvaal Consolidated Land and Union Free State Coal, while it controls the Witbank Colliery. Among other evidence of the Board's claim to confidence is the fact that it was one of the first of the big groups to realize the great future of oil. It showed this by its sponsorship of Trinidad Leaseholds, one of the soundest of the oil-producing companies. Varied industrial participations include Argue Printing and Cape Asbestos, while within the ambit of the group are Hume Pipe Co., Northern Lime, Pretoria Cement, S.A. Forest Investments, etc.

Transvaal Consolidated Land

Transvaal Consolidated Mines & Exploration, a member of the Central Mining group—has always followed a steady course. It is a colliery-owning investment enterprise, with a good share portfolio, mineral and property interests. Some years ago it took an active part in platinum developments in the Transvaal and still has a large interest in a property proved to be underlain by the Merensky reef. Boreholes have intersected encouraging values, and in order to obtain further information as to the nature of the deposit a scheme of underground exploration is being undertaken.

For the year to December 31, 1951, income derived from all sources amounted to £277,320 and after meeting administration and other expenses, the profit was £237,904. The company's Van Dyks Drift Colliery contributed to income an amount of £79,607. Mineral royalties brought in £73,459, while investments and realizations accounted for £119,103. The dividend was repeated at 1s. 9d. per share, absorbing £81,396 and the unappropriated balance was £343,265. Investments stand in the books at £369,457 but they have a market value largely in excess of this; they comprise shares in selective Rand dividend-payers—City Deep, Main Reef, East Rand Proprietary, Blyvoors, etc., together with Orange Free State mines, including Harmony, St. Helena, Welkom, Presidents Brand and Steyn.

Coal production last year from the Van Dyks colliery amounted to 561,492 tons against 584,950 tons. The grade was high but output was restricted by inadequate supplies of railway trucks—a hindrance common to all South African collieries. No difficulty was experienced in fulfilling all orders, and as a result of the fixing of new maximum price at which coal may be sold, producers are now receiving a price more in keeping with costs of production.

Vlakfontein's South-Western Area

The opening up of the south-western section of the Vlakfontein Gold Mine is going forward and a new No. 2 shaft is being sunk well to the west of the property. Meantime, milling operations are making good progress and the tonnage dealt with during 1951 was the best so far, as was the profit.

Ore crushed amounted to 444,000 tons, an increase of 25,000 tons over the previous year. Yield was a trifle better, 7.459 dwt. (7.436 dwt.) and revenue per ton of 97s. 3d. compared with 93s. 10d. The mine was one of the few to reduce its costs which at 49s. 4d. were 7d. per ton lower. These factors together with a larger amount received from gold premium increased working profit per ton to 47s. 10d. against 43s. 11d., and the total aggregate profit to £1,063,465 against £920,224. The necessity of conserving finances to meet capital commitments forced the company to reduce the dividend from 2s. to 1s. 9d., which absorbed £500,000. Taxation called for more at £300,662 (£135,038).

Development footage was 44,885 (44,752) and of the 33,830 ft. sampled, 29.9 per cent proved payable of 8.8 dwt. Work was concentrated in the southern area where payability is lower both as regards percentage and average value than the more fully developed section of the mine which follows on from the Sub Nigel shoot system, and it is therefore to be expected that the opening up of this section will affect development results accordingly.

The new shaft had reached a depth of 102 ft. at the end of the year—progress being retarded by delay in delivery of the equipment. It is anticipated that the reef will be encountered at 6,800 ft. below the surface.

Loraine Gold's Operations

Since it was formed towards the end of 1950, Loraine Gold Mines has gone ahead with shaft sinking, surface work and the general layout of the mine. The property consists of about one-half (the western portion) of what was known as the Wit. Extensions block on which 23 boreholes were put down. According to the consulting engineers' report the results obtained indicated that the Basal reef horizon underlies the area except where interrupted by faulting. It is estimated that the reef lies at a depth of 5,000 ft.

During 1951, No. 1 shaft was sunk to a depth of 3,013 ft., and passed out of the lavas of the Ventersdorp System into the quartzites and conglomerates of the Elsburg Series. No. 2 shaft attained a depth of 836 ft. and sinking was proceeding in the Ventersdorp lavas. Operations were retarded by the intersection of water-bearing fissures but the shafts were concrete lined and supported by the normal shaft steelwork. Sinking hoists and winders were installed together with compressors and permanent steel headgear. Mine buildings and workshops were erected and work in progress at the end of the year included compressor-house, native hostels, office buildings, etc.

Housing accommodation for employees is being provided in the township of Allanridge, near the property, and this has shown satisfactory progress. The provision of services such as water and electrical reticulation, etc. has kept abreast of requirements.

During the year the company's issued capital was increased to £3,000,000 by new shares taken up in terms of the flotation agreement by shareholders in Wit. Extension and "Ofsits." The balance sheet shows shaft sinking and equipment £1,767,843, sundry debtors £254,376, cash £38,313.

G.F. Australian Commonwealth Interests

Although the Gold Fields Australian Development has been in existence twenty years, shareholders have still to look hopefully forward to the future for profitable results. When it was formed for the purpose of becoming interested in mining ventures in the Commonwealth, prospects looked bright but they have not materialized. After investigating numerous properties, attention has been concentrated on interests which are still held—Moonlight Wiluna, Mount Ida and Porphyry Gold. Keen interest was at one time taken in the Mount Charlotte but its flagging followed the disappointing results obtained and the withdrawal of the American Smelting & Refining Co. from its agreement to finance the undertaking.

The company owns the whole of the capital of Moonlight Wiluna Gold Mines which, in turn, owns the Mount Ida and has a one-third interest in the Porphyry Gold Mine. Mount Ida is a gold property, located in the North Coolgardie goldfield some 140 miles north of Kalgoorlie. Developments have been highly favourable and prior to being closed down during the war, was producing in a small way. Operations re-started in 1946 in face of economic conditions and labour difficulties. Underground work has been successful and ore reserves of 125,530 tons averaging 9.13 dwt. have been built up. Milling continued last year and 25,382 tons were crushed for a recovery of 11,151 oz. with an additional 422 oz. from accumulated residues. Shortage of labour restricted development to 688 ft. and the main shaft was sunk to 897 ft. Until conditions become more favourable, the other property—the Porphyry has been put on a care and maintenance basis.

G.F. Australian has a capital of £500,000 in 5s. shares. The 1951 accounts show that General Expenditure exceeded revenue by £3,645, and after taking into account profit of £396 on sale of fixed assets, the balance was added to the accumulated loss brought forward from the previous account of £28,070, making a total loss carried forward of £31,319.

Rand and O.F.S. Mine Returns for April

There was an erratic trend with the Rand gold mining outputs for April. The shorter month accounted for less ore being crushed by 29 producers but 10 mines managed to put through a larger tonnage and 4 the same as in March. Lower profits were announced by 30 mines, while on 12 they were higher and for the first time since its start in November last, Welkom made a small profit. Higher working costs were registered on 29 mines, 11 were lower and 2 worked at the same figure as in the previous month.

Daggafontein's higher throughput was accompanied by a small drop in working costs and slightly higher profit. Another member of Anglo American group to show up well was Western Reefs which dealt with a record tonnage and kept its costs static at 33s. 4d. Springs additional tonnage and lower working costs resulted in a bigger profit.

All the members of the Central Mining group dealt with a lower tonnage and costs were higher on all excepting those of Crown Mines which company's profit was nearly £15,000 up. Blyvoor's lower tonnage and rise of 5d. per ton in costs, resulted in a drop of £22,000 in profit. That of East Rand Props was down by £35,400. No return was made by New Modder as on account of reduced scale of operations, results will now be published quarterly.

A sharp advance in profit of West Driefontein was the feature in the Gold Fields list. Three thousand more tons were dealt with and costs dropped by 1s. 7d. per ton. This was the same saving as was made by Vogelstruisbult in costs, with a rise of £8,300 in profit. Sub Nigel's profit was nearly £8,000 down while Robinson Deep's was half that of March.

In the Union Corporation group, St. Helena's profit was the best so far; that of East Geduld was £12,400 down; Geduld Proprietary was £3,700 and Grootvlei's £7,200.

Of the "Johnnies" producers, higher profits were made by Government Areas, New State Areas and East Champ d'Or and all worked at a lower figure of costs.

Both West Rand and South Roodepoort made normal returns; having regard to the shorter month lower tonnages were dealt with. New Kleinfontein's profit was also satisfactory, although costs rose by 3d. per ton.

Company	*April, 1952* Tons ('000)	Yield (oz.)	Profit (£000)	Yr. ends	*Current Financial Year Total to Date* Tons ('000)	Yield (oz.)	Profit (£000)	*Last Financial Year Total to Date* Tons ('000)	Yield (oz.)	Profit (£000)
Gold Fields										
Libanon	78	15208	33.6	J	795	150,574	362	813	146,407	486
Luipaards V.	97	18241	46.2	J	987	183,497	518	1007	186,795	660
Rietfontein	26	5848	26.7	D	107	23,697	110	108	24,009	126
Robinson	105	1737.1	6.0	D	437	70,683	35	424	68,135	53
Simmer & J.	120	19100	13.0	D	489	77,799	66	480	76,472	128
Sub Nigel	64	22112	112.1	J	661	231,378	1262	660	247,648	1566
Venterspost	93	20926	51.4	J	980	215,649	613	1054	222,154	947
Vlakfontein	36	13428	75.9	D	145	54,108	309	140	53,470	311
Vogels	78	20331	80.8	D	310	80,243	31	294	73,585	329
West Drie	24	10305	50.1	J	65	23,195	71	—	—	—
Anglo American*										
Brakpan	117	21350	39.0	D	452	83,668	154	446	83,743	238
Daggas	236	56338	401.8	D	921	220,187	1566	900	223,998	1746
East Daggas	98	17542	66.0	D	383	68,801	265	392	72,424	355
S. A. Lands	113	20547	77.2	D	441	79,700	296	444	77,566	315
Springs	169	21969	20.1	D	650	85,206	71	664	86,435	149
Welkom	49	8453	1.0	D	167	24,353	L101	368	84,154	444
W. Reef Ex.	114	23868	107.1	D	436	91,668	414			
Central Mining										
Blyvoor	106	65221	574.0	J	1079	685,039	6147	885	632,864	5871
City Deep	155	30266	23.4	D	612	121,988	107	639	130,800	335
Consol M.R.	184	25745	36.5	J	1896	259,597	424	1874	253,050	521
Crown	260	42327	38.2	D	1044	171,545	129	1063	185,254	466
D. Roodep'rt	175	30392	80.2	D	700	120,510	318	704	120,080	404
East Rand P.	201	43531	144.6	D	818	178,188	635	840	170,558	689
Modder B	57	6319	6.7	D	226	24,827	29	215	24,404	37
Modder East	112	13556	20.2	J	1173	137,875	48	1210	145,641	507
Rose Deep	80	11698	10.1	D	329	45,977	47	322	45,647	95
Welgedacht	33	3923	4.3	J	337	39,697	41	329	38,152	42
J.C.I.°										
E. Champ	32	4696	8.0	D	123	19,083	34	127	186,83	45
Govt.G.M.A.	237	31483	50.2	D	900	129,012	198	890	123,520	241
New State	47	6455	1.0	D	175	26,417	4	230	31,007	19
Randfontein	342	41621	30.0	D	1384	167,736	115	1275	160,321	209
Wit. Gold	58	7085	2.5	D	235	27,959	10	232	26,953	22
Union										
East Geduld	142	42612	335.4	D	574	172,218	1360	564	169,214	1380
Geduld Prop.	102	14794	33.8	D	416	60,356	149	416	61,564	193
Grootvlei	195	42125	272.8	D	768	166,535	1064	773	173,921	1196
Marievale	59	14868	69.2	D	239	59,840	280	239	59,728	300
St. Helena	45	8838	4.1	D	175	34,251	10	—	—	—
Van Dyk	106	15304	12.0	D	423	61,477	49	397	59,204	77
General Mining*										
S. Roodep'rt.	26	5968	21.9	J	270	60,423	225	266	59,670	224
W.RandCon.	206	32116	117.0	D	819	127,851	470	819	131,166	632
Anglo Transvaal*										
N. Klerksd'p	11	1,262	1.0	D	43	4,855	4	33	3,974	5
Rand Leases	188	31489	74.0	J	1840	308,973	799	1864	301,148	949
Village M.R.	34	5310	15.7	J	341	52,993	174	347	52,581	193
Others										
N. Kleinf't'n	103	13,595	31.2	D	412	54,324	422	424	55,192	177
Spaarwater	10	2270	L2.5	D	41	9,306	L12	41	9,181	L12
W. Nigel*	15	—	0.7	J	109	—	3	100	—	18

Notes.—Profit figures are in all cases figures of working profit excluding profit from sale of gold at premium prices. In case of groups marked with an asterisk (*) profit includes sundry revenue. Profit figures preceded by L indicate a loss.

Fiji's Gold Output to be Sold on Free Market

The Fijian Government have followed the example of Southern Rhodesia and West Africa in allowing the whole of the country's output to be disposed of for dollars on the premium market as from May 1.

This disclosure has been announced from the London offices of Emperor Mines and Loloma (Fiji) Gold Mines who also state that in view of the more favourable taxation towards the mining industry now contemplated by the Fiji Government, the Emperor, Loloma and Dolphin Mines have each applied for prospecting licences covering large areas in the Vatukoula-Tavua Goldfield. These new areas aggregate approximately 14,000 acres and are contiguous.

The mining companies have applied for these areas with a view to testing by comprehensive geological survey, followed by large scale churn drilling. Some of the holes to be drilled will be in the proximity of 2,500 ft. in depth.

The programme recommended by the Chief General Manager, Mr. N. E. Nilsen, covers approximately three years, for an estimated cost of £200,000, including plant and equipment. Further expansion and expenditure beyond this amount will be considered in the light of the then existing circumstances. The total expenditure will be shared equally by the three operating companies at Vatukoula-Emperor, Loloma, and the Dolphin. Any benefits arising from the proposed programme will be shared equally by these companies. The surface indications in this area suggest the possibility of values below the mudstone formation, which covers a large portion of the Tavua Basin.

From the commencement of mining operations on the Vatukoula field in 1935 to December 31, 1951, ore treated from the Emperor, Loloma, and Dolphin Mines totalled 2,506,563 tons, from which 1,277,884 f.oz. gold and 350,000 f.oz. silver were won.

Company Shorts

African & European Investment Co., Ltd.—Total income of African & European Investment Co., Ltd. for the calendar year 1951 expanded from £714,482 to £977,654 and included income from dividends, share dealings, sale of farms, mineral interests, etc. General expenses, including capital increase expenses of £1,338, was virtually the same as in the previous year, £44,623 against £45,862. But the interest on the 4½ per cent unsecured unconvertible notes required £76,500 against nil, giving a profit before taxation of £856,531 compared with £668,620 in the preceding year.

Taxation liabilities were heavier at £114,000 (£70,000), expenditure on mineral rights and prospecting written off was £27,412 (£27,703) but £167,500 was appropriated to write off shareholdings compared with £130,000 in the previous year. The allocation to general reserve was lower at £355,000 (£400,000). The dividend distribution on the £1,300,000 issued capital in units of 10s. each was maintained at 2s. 6d., which required £325,000. The carry forward at the fiscal year end amounted to £236,286 compared with £264,106 brought in.

Apart from real estate, mineral rights, etc., which had a book value of £270,901, the principal assets of the company are its investments, amounting in total to £6,689,781. Quoted investments appear in the balance sheet at £5,824,308, the market value at December 31, 1951, being £11,827,282.

During the year the Anglo American Corporation was called upon to subscribe for the 900,000 unissued 6 per cent 10s. cumulative preference shares. This increased the company's issued capital to £3,050,000.

Mr. R. B. Hagart is chairman. The annual meeting will be held in Johannesburg on June 13.

American Metal Company and Rhodesian Domicile.—Transferring the domicile of the Rhodesian companies to Northern Rhodesia would now result in a substantial tax saving, Mr. Harold K. Hochschild, chairman, told the annual meeting of the American Metal Co. Nevertheless, he said, the company would still continue to examine that situation before deciding upon such a move.

Questioned in regard to a statement in the annual report that production in Northern Rhodesia will be lower during the current fiscal year "due to the greater shortfall in coal deliveries," Mr. Hochschild replied that the mines are not able to produce enough coal and that the railroads could not properly handle the coal available.

The Rhodesian company had "no control" over the situation, although they were pressing for an improvement, he said. Furthermore, financial assistance may be requested from the American Government and the Southern Rhodesian Government, Mr. Hochschild stated. In addition, the company is actively exploring the use of hydroelectric power, he said.

Questioned as to future prospects for copper, Mr. Hochschild predicted a substantial increase in copper over the next 15 to 20 years assuming users of copper and usage of copper grow in number. At the moment, he pointed out, it is hard to see where the copper will be coming from. He added, however, that there is still much undeveloped land and many mines which could be placed in operation.

St. John d'el Rey to Make "Rights" Issue.—St. John d'el Rey Mining have decided to make an issue of Ordinary Capital in the form of rights, to ordinary stockholders whose names appear on the registers on the 19th May, 1952, in proportion of one £1 ordinary share for every £14 ordinary stock held, at a price of 21s. per £1 ordinary share. Provisional Letter of Allotment will be posted to stockholders on June 13, 1952.

Tharsis Raises Dividend.—Trading profit of the Tharsis Sulphur and Copper Co. for the calendar year 1951 amounted to £502,449 against £366,480 in the preceding year. This was the chief item comprising gross revenue of £506,822 (£369,957) which, however, after providing for all expenses and taxation, amounting to £161,996 (£136,412) was reduced to £192,332 against £124,126 in 1950.

The allocation to plant replacement reserve was doubled at £100,000 and the dividend payment of 12½ per cent (10 per cent) absorbed £82,031 (£65,625) leaving the carry forward at £193,789 compared with £183,488 in the previous year.

Mr. W. P. Rutherford is chairman. The annual meeting will be held in Glasgow on May 21.

Coronation Syndicate has announced that the board is satisfied that although the majority of the Company's operations are in Southern Rhodesia there would not be sufficient advantage gained to remove the head office of the Company from Johannesburg to warrant such action being taken. At the Annual Meeting held in December, 1951, it was stated that the question of domicile was under consideration.

Mason & Barry Pay More.—Mason & Barry in the preliminary announcement state that profit for the year ended December 31, 1951, after providing for all charges including £68,000 for taxation (£40,974) and £14,827 (£14,756) for depreciation, amounted to a profit of £45,038 compared with £25,869.

The board has recommended the payment of 15 per cent and a cash bonus of 5 per cent, making 20 per cent (15 per cent) for the year, which will absorb a net amount of £19,443. The sum of £20,000 was allocated to reserve, leaving the carry forward at £38,797 compared with £33,202 in the preceding year.

London Australian to Make Return of Capital.—The London Australian & General Exploration Co. have announced that the accounts of the company up to April 30, 1952, will be submitted to shareholders at a general meeting to be held in the near future. Proposals will be submitted at the meeting for some return of capital to shareholders and suggestions will be made concerning the re-organization of the company's capital.

Larut Tin Pays 70 Per Cent.—Net profit of Larut Tin Fields for the calendar year 1951, after providing for all expenses and £129,571 for taxation (£43,231) was £2120,472 against £140,722 in 1950. The dividend distribution totalled 3s. 6d. per 5s. share against 2s. in the preceding year. The carry forward at the fiscal year end was £121,648 against £62,796.

The improved results were not only due to the increase in the price received, which rose from £702 to £1,051 per ton of metallic tin, but also to the higher output which totalled 882 tons as against 854 tons in 1950.

The company is incorporated in Malaya. Mr. W. M. Warren is chairman.

Henry Rogers (London) Ltd.—Henry Rogers, Sons & Co. have announced that in association with Messrs. C. Tennant, Sons & Co. they have formed a new private company, Henry Rogers (London) Ltd. to continue uninterrupted the old established business carried on since 1807 under the style of Henry Rogers, Sons & Co. Mr. John C. Dekker, son of the managing director, Mr. J. C. Dekker is joining the company as secretary. Mr. E. W. D. Tennant is chairman and Mr. L. Guy is a director.

All outstanding arrangements of Henry Rogers, Sons & Co. will be taken over by the new company, Henry Rogers (London) Ltd.

Tin Companies Production Jan-March, 1952

MALAYA

Ampat.—314½ tons tin conc.
Ayer Hitam.—398½ tons tin conc.
Batu Selangor.—76½ tons tin conc.
Berjuntai.—222½ tons tin conc.
Chenderiang.—41 tons tin ore.
Gopeng.—206½ tons tin ore.
Idris Hydraulic.—69½ tons tin ore.
Ipoh.—147½ tons tin ore.
Hong Kong.—43 tons tin ore.
Jelapang.—80½ tons tin conc.
Kamunting.—631½ tons tin conc.
Kampong Lanjut.—98½ tons tin conc.
Kent F.M.S.—121½ tons tin ore.
Kepong.—80½ tons tin ore.
Killinghall.—197 tons tin conc.
Kinta Kellas.—53 tons tin ore.
Kinta Tin.—62½ tons tin ore.
Klang River.—70 tons tin conc.
Kramat Tin.—59½ tons tin conc.
Kuala Kampar.—449½ tons tin conc.
Kuchai.—99½ tons tin conc.
Larut.—237 tons tin conc.
Lower Perak.—278½ tons tin conc.
Malaysiam.—9½ tons tin conc.
Pahang.—653 tons tin conc.
Pari.—4½ tons tin conc.
Malayan Tin Dredging.—321½ tons tin ore.
S. Malayan Tin Dredging.—552 tons tin ore.
Pengkalen.—138½ tons tin ore.
Petaling Tin.—508½ tons tin ore.
Rahman.—91½ tons tin ore.
Rambutan.—17½ tons tin ore.
Rantau.—273 tons tin conc.
Rawang Conc.—185 tons tin conc.
Rawang Tin.—238 tons tin conc.
Renong.—247 tons tin ore.
Selayang.—70½ tons tin conc.
Southern Kinta.—1,095½ tons tin conc.
Sungei Kinta.—87½ tons tin ore.
Sungei Besi.—277 tons tin ore.
Sungei Way.—92 tons tin ore.
Southern Tronoh.—148 tons tin ore.
Taiping Consol.—121½ tons tin conc.
Tambah.—22½ tons tin conc.
Tanjong.—309 tons tin conc.
Tekka Ltd.—42¼ tons tin ore.
Tronoh Mines.—311 tons tin ore.
Tekka Taiping.—79½ tons tin ore.
Temoh Tin Dredging.—43½ tons tin conc.
Tongkah Harbour.—81 tons tin conc.

NIGERIA

Amalgamated Tin.—1,149 tons tin conc. & 107 tons columbite.
Bisichi.—208 tons black tin and 53 tons columbite.
Ex-Lands.—159 tons tin conc.
Gold and Base Metals.—135 tons tin conc.
Jantar Nigeria.—69 tons tin.
Kaduna Prospectors.—22½ tons tin ore.
Kaduna Syndicate.—61 tons tin ore.
Keffi.—66 tons tin conc.
Naraguta Extended.—18 tons tin ore.
Naraguta Karama.—32 tons tin ore.
Naraguta Tin.—83 tons tin ore.
Ribon Valley.—22 tons tin conc.
Rukuba.—6 tons tin ore.
S. Bukeru.—11½ tons tin ore.
Tin Fields of Nigeria.—6½ tons tin ore.
United Tin Areas.—25 tons tin conc.

MISCELLANEOUS

Bangrin.—193 tons tin ore.
Beralt Tin.—642 tons wolfram conc. and 43 tons tin conc.
Geevor.—195 tons black tin.
Kamra.—51½ tons tin conc.
Kamunting.—631½ tons tin conc.
Puket.—126½ tons tin conc.
Siamese.—411½ tons tin ore.
South Crofty.—69½ tons black tin and 1½ tons wolfram.
Zaaiplaats Tin Mining.—Profit £36,019.

THE RHODESIA BROKEN HILL DEVELOPMENT CO. LTD.

The Forty-Second Annual General Meeting of The Rhodesia Broken Hill Development Co. Ltd., will be held at Kitwe, Northern Rhodesia, on June 4.

The following is an extract from a statement, dated May, 1952, by the chairman, **Sir Ernest Oppenheimer**, circulated with the annual report and accounts for the year ended December 31, 1951:—

The past year's operations resulted in establishing new records for this company. Sales, which amounted to almost £8,000,000, were nearly double those of the previous year, whilst the resulting profit, before taxation, of approximately £5,750,000, is almost precisely £3,000,000 greater. These figures are a reflection of the high prices of zinc and lead which obtained throughout the greater part of 1951.

The figures now published must, however, be regarded as abnormal. Since the beginning of 1952, world prices of both zinc and lead have fallen and, on present indications, it is likely that the current year's operations will show a smaller profit, although there is every reason to think that it will still be most satisfactory.

It is somewhat paradoxical that the recent recession in the price of zinc coincides with that metal being brought under the control of the International Materials Conference, whereby available world supplies are allocated to consumer countries on a quota basis, since this would normally have been expected to indicate a world shortage. At the present time, however, the indications are that a buyer's market has developed, and it remains to be seen whether the present tendency will persist, and if it does, whether this will lead to the removal of control. Lead has not been subject to International allocation, and the market has not weakened to the same extent as in the case of zinc.

Many members will have seen reference in the Press to the serious flooding which took place at the Mine during March of this year. This was caused by completely abnormal and protracted rains, resulting in underground waters in the vicinity rising in many places almost to ground surface level. The volume of water was in excess of pumping capacity and it was necessary to remove equipment and temporarily to discontinue working on the 550 ft. level. Emergency steps were taken to provide increased pumping capacity and these fortunately coincided with the complete cessation of the rains. Metal production had to be curtailed slightly, in the case of lead only, during March and April and ore requirements were virtually maintained by working double shifts on higher levels, supplemented by some drawing from surface stocks. Whilst it may well transpire that similarly heavy rains will not occur in the future, the provision of additional pumping capacity, capable of dealing with any recurrence of the abnormal situation, is under consideration.

Your Board decided in December, 1951, to declare, for the first time, an interim dividend and in view of the satisfactory position which this company has reached, after many vicissitudes, it is intended that this shall be a regular practice. In deciding to recommend to members a final dividend of 3s. 3d., making 4s. 6d. per stock unit for the year, your Board were actuated primarily by the view that members were entitled to receive by way of dividend the fruits of the past year's favourable results, but they nevertheless considered that it would be wise to set aside some part of the profits and therefore decided to place £500,000 to General Reserve, which amount will, of course, be available to meet any future contingencies.

The result of recent investigations has led to a decision to produce refined cadmium and the design of the necessary plant is at present being undertaken in collaboration with specialist consultants.

No final decision has yet been reached regarding the scope of future operations at the Iron Duke Mine in Southern Rhodesia and our policy in regard to the supply of pyrites, for which there are increasingly heavy enquiries, must be subject to the over-riding consideration that this Mine forms the natural and, so far as is known, the only potentially large-scale source of supply of this material to meet the requirements of the Northern Rhodesia Copper Mines.

In conclusion, I reiterate what I have said earlier in this statement—that I do not expect the record results of 1951 to be repeated this year. Your compan'ys affairs are, however, in excellent order; plant extensions have necessarily been delayed, but their completion in the near future is now certain and will ensure that the treatment of your company's ores is on a properly balanced basis. This fact, combined with the present very satisfactory financial position, enables me to regard this company's future prospects with every confidence.

Copies of the annual report and accounts may be obtained from the Head Office, Kitwe, Northern Rhodesia, or from the Transfer Offices at 44, Main Street, Johannesburg, and 11, Old Jewry, London, E.C.2.

LYNDHURST DEEP-LEVEL (GOLD & SILVER)

DIVIDEND OF 15 PER CENT

The Annual General Meeting of Lyndhurst Deep-Level (Gold and Silver) Ltd., was held on May 14 at the Chartered Insurance Institute, 20, Aldermanbury, London, E.C., **Mr. Robert Annan, M.I.M.M.**, chairman of the company, presiding.

In the course of his speech, the chairman said:

I regret to report that development results during the past year have been disappointing. The surface geological survey was continued during the year and has now covered an area two miles wide by 13 miles long embracing the whole extent of the known vein system within the concessions. This work has involved the cutting of 177 miles of line in the bush, the taking and testing of 8,870 samples, the cutting of 14,000 ft. of trenches and shallow underground workings, and 12,000 ft. of diamond drilling. Though a number of quartz reefs were exposed, none has yet proved of economic value and surface work has now been suspended. These results, together with those of previous surveys, make it highly improbable that any outcrop of value has been overlooked.

UNDERGROUND DEVELOPMENT

Underground development has been restricted by limited shaft capacity and points of attack. Some further ore of good grade has been developed on the upward extension of the Boabedroo ore-shoot at the 5th level leaving only the block between this and the 4th level, which itself showed no ore at this point, to be explored. The 6th level has been driven north and has passed under the northern ore-shoots on the upper levels without disclosing any payable values and it appears that these ore bodies do not extend down to this horizon.

The 4th level is being extended northwards to explore the area in which some surface showings were found 2,500 ft. from the Boabedroo shaft and a crosscut is being put out on the 6th level to the south-east to test the line of the Awere Reef. Konongo is also extending its 9th level southwards on the Odumase vein into our Odumase concession as reported last year. As a result of all this work it is impossible to escape the conclusion that the hopes of finding further substantial ore bodies in our concessions are rapidly diminishing.

CHANGE IN POLICY

In these circumstances there has been a change in our production policy. The surface dumps of development ore were exhausted last year and as little ore has been coming from current development it was decided to begin mining ore from developed reserves while this can be treated in the Konongo mill under arrangements where the overhead expense is shared. While the tonnage milled under this policy fell to 19,170 tons, compared with 32,995 tons in the previous year, the grade rose from 7.30 to 19.81 dwt. per ton and the gold output from 10,271 to 17,202 oz.

Ore reserves at the end of the year amounted to 53,150 tons, averaging 16.0 dwt. over 56 in. Of this amount 8,900, averaging 10.3 dwt., is in pillars.

KONONGO INTEREST

Our interest in Konongo Gold Mines Ltd., remains unaltered. Payable development results in that property were confined to the Boabedroo section where a block of high-grade ore about 400 ft. long has been proved between the 9th and 10th levels. While this in itself is gratifying and ensures the continuance of the present small scale operations for some time, the behaviour in depth of this ore body is of vital importance to the future of the mine as the rest of the development has continued to be unproductive.

As I indicated earlier in my remarks, the entire surface of the vein system within your concessions has now been examined in detail with results that can only be described as disappointing. A limited amount of underground work remains to be done to test some of the surface showings at depth and this is being continued, but it would be unwise to be too optimistic about the results. A full account of the recent geological survey by the geologist, Mr. C. P. Tremlett, is being published in *Mine and Quarry Engineering* and we have arranged for reprints to be available after publication to any shareholders who may be interested and who apply to the company's office.

I referred last year to the discovery at surface of a manganese-bearing zone. This has now been traced for about three miles with widths varying from 50 to 90 ft. The average grade appears to be from 16 to 20 per cent manganese, which is well below commercial requirements. Initial tests at concentration have not been successful, but further investigation is in progress.

Production at the mine is continuing on about the same scale and in the first quarter of the current year 4,550 tons were milled for a yield of 4,235 oz. of gold.

Our thanks are due to the manager and staff of Konongo Gold Mines Ltd., and to our consulting engineers for their conduct of operations in the past year.

The report and accounts were adopted and the retiring directors, Mr. F. N. Keith and Mr. B. W. Mason, were re-elected.

EAST GEDULD MINES, LTD.

RECORD WORKING REVENUE

Mr. P. M. Anderson, the chairman of the company, in addressing stockholders at the annual general meeting held at Johannesburg on May 6, said that the tonnage milled in 1951 at 1,738,000 tons was the same as in the previous year, and the output at 521,469 f.oz. showed a slight increase. The premium from sales of gold at enhanced prices for industrial and artistic purposes was considerably higher than in 1950 and brought in £322,669. The working revenue rose by £209,147, or 2s. 5d. per ton, to the record figure of £6,811,129. Owing to further rises in the prices of stores and commodities and to certain increases in wages and other benefits granted to employees during the year under review, working costs rose by 1s. 3d. per ton milled and the working profit at £4,604,113 was only £99,098 more than for the previous year.

He stated that largely owing to the increase in the formula tax which became effective from January 1, 1951, provision for taxation increased by £191,925 to £2,522,275. After taking into account income from investments amounting to £82,557, being mainly dividend income from the company's holding of 537,600 stock units in The Grootvlei Proprietary Mines Ltd., and the other items detailed in the profit and loss account, the net profit was £2,158,393, or £96,065 less than the 1950 figure. Dividends totalling 4s. 4d. per unit of stock, being 3½d. per unit less than in 1950, were declared and absorbed £1,950,000. After providing £144,125 for capital expenditure and setting aside the other amounts detailed in the appropriation account, the carry-forward was increased by £64,417 to £557,797.

DEVELOPMENT

A total of 11,132 ft. of development was accomplished on Main Reef, of which 7,195 ft. were on reef and sampled, disclosing 3,470 ft., or 48 per cent, payable with an average value of 7.8 dwt. over 24 in. In addition, 2,190 ft. of development was accomplished on the Kimberley Reef Horizon in the region of No. 1A sub-vertical shaft. Most of this development consisted of cross-cutting and only 335 ft. were on reef and sampled, disclosing no payable values.

The recalculated ore reserve decreased by 100,000 tons to 12,400,000 tons. The value and estimated stoping width remained unchanged at 5.7 dwt. and 51 in. respectively.

The ore milled during the first quarter of 1952 was 432,000 tons and the working profit was £1,024,855. In addition, £49,725 accrued to the company from premium gold sales. Development work on Main Reef totalled 2,604 ft. and of this 1,495 ft. were sampled disclosing 675 ft., or 45 per cent, payable averaging 8.4 dwt. over 22 in. 594 ft. of development was accomplished on Kimberley Reef, and 475 ft. were sampled disclosing a negligible payable footage.

For some time past, owing to the general increase in electric power demands in the Transvaal and Orange Free State and to the delayed installation of new generating plant, the Electricity Supply Commission had found it increasingly difficult to supply the gold mining industry with its full power requirements and had intimated that this inability would continue for several years. In order to meet this position, it had been necessary, *inter alia*, to curtail milling during periods of peak loads on weekdays and to make good the tube mill hours so lost by operating the reduction plant on Sundays. So far these arrangements had ensured that there was no loss of production but if further power cuts had to be imposed, some loss of output might result.

The motion for the adoption of the reports and accounts was carried unanimously and the retiring directors, Messrs. C. B. Anderson and M. W. Richards, were re-elected.

ST. HELENA GOLD MINES LTD.

DEVELOPMENT PROGRESS

Mr. P. M. ANDERSON'S SPEECH

Mr. P. M. Anderson, the chairman of the company, in addressing shareholders at the Annual General Meeting held at Johannesburg on May 6, said that in March, 1952, the issued capital of the company was increased from £3,750,000 to £4,812,500 by the issue of 2,125,000 new shares at a price of 16s. 0d. per share, leaving 375,000 shares in reserve. Out of the proceeds of this issue, amounting to £1,700,000, the temporary loan from Union Corporation had been repaid with accrued interest and the balance of the funds available were being used to finance capital expenditure at the mine which was largely in connection with necessary excess development. Apart from loans on the security of the company's houses, which were repayable in moderate annual instalments, the company was now free of debt.

It was essential at present to carry out the maximum amount of development work in order to build up ore reserves, which at the year-end amounted to 625,000 tons having an average value of 5.9 dwt. over an estimated stoping width of 48 in., and also to provide as rapidly as possible sufficient stope faces to feed the reduction plant with stope ore on a scale commensurate with the plant's full capacity of 80,000 tons per month. So far the rate of development work during the current year had exceeded that of last year by nearly 60 per cent and the amount of payable footage developed had shown a welcome increase, though it would take some time materially to improve the stope face position.

The value of ore being sent to the reduction plant was below the average grade of the mine, as only about half of the tonnage milled was coming from stopes. The yield had, however, improved with the gradual increase in the proportion of ore from stopes since milling commenced, so that during the current year the mine had been earning modest working profits on an increasing scale in contrast to a working loss of £43,995 for the two months of milling in 1951.

THE CURRENT YEAR

During the first quarter of the current year, the tonnage milled was 130,000 tons and the working profit therefrom £5,542, to which must be added £11,772 from premium gold sales. The total footage driven amounted to 15,840 ft., of which 8,485 ft. were on Basal Reef and sampled, disclosing 3,085 ft., or 36 per cent, payable, averaging 13.9 dwt. over 25 in.

For some time past, owing to the general increase in electric power demands in the Transvaal and the Orange Free State and to the delayed installation of new generating plant, the Electricity Supply Commission had found it increasingly difficult to supply the gold mining industry with its full power requirements and had intimated that this inability would continue for several years. In the case of St. Helena it had been necessary to curtail milling during certain periods of the day, but as the milling capacity was at present greatly in excess of the tonnage being produced, it had been possible fully to make up for time lost.

In concluding, Mr. Anderson said that steady progress had been made since production started and provided there were no unforeseen setbacks shareholders could look forward to continued and in due course more rapid improvement in the mine's position.

The motion for the adoption of the reports and accounts was carried unanimously and the retiring directors, Messrs. C. B. Anderson, H. F. Oppenheimer and M. W. Richards, were re-elected

DIVIDENDS

Anglo-Egyptian Oilfields 12½% (June 23)
British Aluminium 8%
British Guiana Cons. Goldfields 8%
British Ropes 9½%
Chicago Gaika Development 10%
General Tin Investments 6% *i*
Imperial Chemical Industries 3% *i*
Lake Shore Mines 10c.
Mining Corporation of Canada 50c *i*
Mufulira Copper Mines 3s. *i* (May 19)
Pahang Consolidated 30% *i*
Petaling Royalties 20%
Rhodesian Anglo American 12½% *i*
Rhodesia Broken Hill Development 65%
Rhokana Corporation 50% *i* (May 30)
Rio Tinto Co. 35%
San Francisco Mines of Mexico 60%
St. John d'el Rey Mining 7½%
Surprise Mining & Finance 12½%

i interim • Tax free

JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD.

(Incorporated in the Union of South Africa)

MINING COMPANIES' REPORTS FOR QUARTER ENDED MARCH 31, 1952

GENERAL REMARKS—The revenue from gold has been calculated on the basis of gold at **248s. 3d.** per f.oz. In determining the payable development footage, gold has been taken at **248s. 3d.** per f.oz. The development figures are the actual results of the sampling of development work on reef; no allowance has been made for modifications which may be necessary when computing the ore reserves.

10 and 11, Austin Friars, London, E.C.2. May 14, 1952.

The East Champ D'Or Gold Mining Co. Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£259,875**
Crushed **91,000** tons; yielding **14,388** oz. fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold	178,591	...	39 3		
Working Costs.....	153,060	...	33 8	...	212 9
	25,531	...	5 7		
Sundry Revenue.....	783				
Profit for Quarter	26,314				

In addition to the above, **£6,497** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.
Taxation for the quarter is estimated at **£12,505.**
The expenditure on Capital Account amounted to **£113.**
The **DEVELOPMENT FOOTAGE** sampled totalled **685** ft., and gave the following results: **PAYABLE, 255** ft., having an average value of **6.0** dwt. over **30** in. **UNPAYABLE, 430** ft., having an average value of **2.0** dwt. over **37** in.

Government Gold Mining Areas (Modderfontein) Consolidated Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£1,400,000**
Crushed **663,000** tons; yielding **97,530** oz. fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold	1,210,597	...	36 6		
Working Costs.....	1,082,977	...	32 8	...	222 1
	127,620	...	3 10		
Sundry Revenue.....	19,757				
Profit for Quarter.....	147,377				

In addition to the above, **£44,410** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.
The Government's share of profits for the quarter is estimated at **£33,242.**
The expenditure on Capital Account amounted to **£8,775.**
The **DEVELOPMENT FOOTAGE** sampled totalled **10,510** ft., and gave the following results: **PAYABLE, 5,960** ft., having an average value of **5.4** dwt. over **42** in. **UNPAYABLE, 4,550** ft., having an average value of **1.8** dwt. over **38** in.

New State Areas Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£1,514,037**
Crushed **128,000** tons; yielding **19,962** oz. fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold	247,779	...	38 9		
Working Costs.....	248,524	...	38 10	...	249 0
	745	...	0 1		
Sundry Revenue.....	3,883				
Profit for Quarter.....	3,138				

In addition to the above, **£8,917** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.
(*Note:* There was no liability in respect of Government's share of profits or taxation for the quarter.)
The **DEVELOPMENT FOOTAGE** sampled totalled **1,504** ft., and gave the following results: **PAYABLE, 357** ft., having an average value of **10.4** dwt. over **21** in. **UNPAYABLE, 1,147** ft., having an average value of **3.0** dwt. over **23** in.

The Randfontein Estates Gold Mining Co., Witwatersrand, Ltd.
(Incorporated in the Union of South Africa)

ISSUED CAPITAL.....**£4,063,553**
Crushed **1,042,000** tons; yielding **126,115** oz. fine gold.

	£		Per ton crushed s. d.		Per oz. fine gold produced s. d.
Revenue from Gold	1,565,399	...	30 1		
Working Costs.....	1,492,870	...	28 8	...	238 9
	72,529	...	1 5		
Sundry Revenue.....	12,784				
Profit for Quarter.....	85,313				

In addition to the above, **£36,628** accrued during the quarter in respect of increased revenue from sales of gold at enhanced prices.
Taxation for the quarter is estimated at **£10,838.**
The expenditure on Capital Account amounted to **£2,070.**
The **DEVELOPMENT FOOTAGE** sampled totalled **12,620** ft., and gave the following results: **PAYABLE, 3,655** ft., having an average value of **6.7** dwt. over **35** in. **UNPAYABLE, 8,965** ft., having an average value of **1.8** dwt. over **33** in.

CONSOLIDATED MURCHISON (TRANSVAAL) GOLDFIELDS AND DEVELOPMENT COMPANY, LIMITED

(Incorporated in the Union of South Africa)

Directors' Report for the Quarter ended March 31, 1952.

The following is the report on the work done during the quarter ended March 31, 1952:—

Tons Crushed.....	**36,065**
Estimated Profit from Antimony and Gold.....	**£478,572**
Estimated Taxation.....	**£128,000**

In addition, revenue of **£724** was received during the quarter in respect of increased revenue from the sales of gold at higher than standard prices.

The Capital Expenditure during the period amounted to **£50,898.**

During the quarter the Development footage accomplished amounted to **4,087** ft., of which **1,888** ft. were in the ore body. The sampling of **1,436** ft. in the ore body gave the following results:—

Payable on account of the combined gold and antimony content **1,270** ft.; Unpayable, **166** ft.

In determining the payable footage the prices of Gold and Antimony as at March 31, 1952, have been used.

The development figures mentioned above are the actual result of the sampling of development work in the ore body; no allowance has been made for modification which may be necessary when computing the ore reserves.

By Order of the Board,
ANGLO-TRANSVAAL CONSOLIDATED INVESTMENT COMPANY, LIMITED.
Secretaries,
Johannesburg.

Metal and Mineral Trades

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